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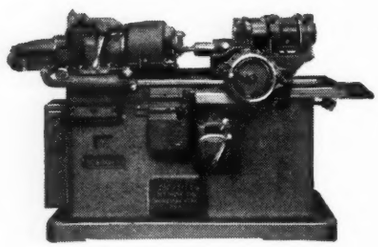
¶ As 1928 closes, it ends the one hundred and second year of history for The Heald Machine Company. ¶ It also completes a quarter of a century that we have been established at Worcester where we have devoted our efforts exclusively to Internal and Surface Grinding Machines. ¶ Tremendous strides have taken place in these products during that time, particularly the last few years, when improvements have gone forward by leaps and bounds until with the entrance of 1929, we can offer grinding equipment giving results that far surpass even the most optimistic of even two or three years ago. ¶ In no small measure has our success been due to the co-operation and loyalty of our many customers who have offered suggestions that were invaluable and unobtainable except under actual manufacturing conditions. ¶ Thus at this season of the year our thoughts turn to those whose friendly business has made possible bigger and better things and each member of our organization expresses to every member of your organization the heartiest greetings of the season and desires that in the coming year we may become even more closely connected thru friendship, service and satisfactory business relationship.



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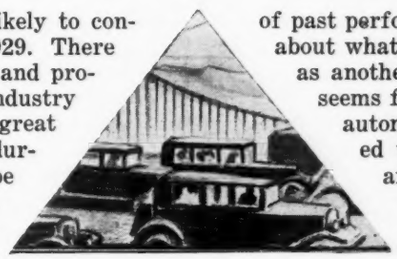
AUTOMOTIVE INDUSTRIES
VOLUME 59 *Philadelphia, Saturday, December 29, 1928* NUMBER 26

1929 Car and Truck Business Likely to Surpass 1928

Signs indicate that industry in coming year faces even greater prosperity than was experienced during last 12 months. Production of 4,750,000 cars and trucks estimated.

By Norman G. Shidle

THE automotive industry seems likely to continue to break records during 1929. There is every indication that in sales and production of both cars and trucks the industry will next year go ahead even of the great profit-producing quantities established during 1928. Huge gains are not to be looked for, to be sure, but gains can be predicted without any great stretch of the imagination.



Assuming familiarity with the automotive industry in general and access to detailed records and figures of past performances, one man's quantitative guess about what is going to happen in 1929 is as good as another's. In making estimates, however, it seems fair to keep in mind the fact that most automotive manufacturers today have learned the dangers of volume without profits and seem likely to gage their actual output with this thought in mind. Here is how 1929 looks to *Automotive Industries* on the basis of facts, figures, opinions and general business analyses available at the present time:

1929
Estimated Total Motor Vehicle Production
United States and Canada
4,750,000

Passenger Cars		Trucks	
Estimated United States and Canadian Production	4,115,000	Estimated United States and Canadian Production	635,000
Estimated Canadian Production	215,000	Estimated Canadian Production	60,000
Estimated United States Production	3,900,000	Estimated United States Production	575,000
Estimated United States Domestic Sales to Dealers	3,365,000	Estimated United States Domestic Sales to Dealers	375,000
Estimated Exports including foreign assemblies	535,000	Estimated Exports including foreign assemblies	200,000

Obviously all of the above figures are purely estimates; in compiling them the hope has been to have them correct within plus or minus 5 per cent. Some of them are admittedly open to dispute statistically, but they represent a careful consideration of all the data relating both to general business conditions and to past automotive performance specifically. They are recorded thus definitely merely in the hope of conveying a general idea of the outlook quickly, and in no sense as being an accurate quantitative representation

We have just passed through one of the most profitable years the automotive industry has ever had in practically all of its branches, and yet it is doubtful if the total production capacity of the industry has been taxed to more than 70 per cent of its potential, taking the year 1928 as a whole. The predictions for 1929 made on the previous page would indicate operation at about the same per cent of total capacity for the coming 12 months.

No Need for Alarm

With these facts before us, the need vanishes for alarm at a production capacity of nearly 7,000,000 vehicles and a probable salable market of somewhere between 4,500,000 and 5,000,000. Even the intensification of competition which seems almost certain among makers of cars selling for less than $800 loses many of its threatening aspects when viewed in relation to the very keen competition which already has existed in that field for some time and in relation to the unusually bright general business and economic outlook which makes itself apparent as the industry goes into the new year.

Analysis of formally and informally announced production plans of producers in the low-priced field does indicate that one of three things must happen: Either cars in this group will comprise a far greater percentage of total output than ever before; or the total output of the industry itself must run over the 6,000,000 mark; or the current plans of one or more of the producers in this group must go awry to some extent. It is perfectly possible—probable perhaps—that what actually will happen is that a majority of the companies in this particular competitive group will do a good, profitable business without any one of them reaching quite the goal publicly set for itself.

But the certainty with which good business and good profits are predicted for automotive firms in general and with which an advance in sales is estimated for 1929 even over the record-breaking 1928 automotive performance, lies primarily in the general business picture as it applies to all industries at the moment.

Manufacturing and trade started in 1928 at a moderate pace, but soon began to accelerate and have in recent months rapidly gained momentum, with the most impressive figures being established recently. This momentum alone, if other reasons for confidence were lacking, would be sufficient to carry the country along on a high tide of business well into 1929.

The leading industries all have shown record strength, particularly building, steel and automobiles, the bulwarks of prosperity in late years. The exceptions to the trend are not many, these being principally coal, textiles, railroad equipment and sugar. The farmer, long a laggard in the stream of prosperity, has come into his own. Prices this year of some crops have declined, but in most instances there has been more than a corresponding gain in yield, so that the value of the leading farm products, according to recent estimates, will run nearly 6 per cent over that of 1927.

Among industrial workers employment has been steady and wages have maintained good levels. There has been, moreover, no extreme fluctuation in commodity and raw material prices.

There remains for consideration what is probably the only factor in business today that causes any real concern—the credit situation. And perhaps the real reason for a good deal of the concern expressed is that no one can predict with assurance the ultimate outcome of the pressure on credit facilities placed by the demands of the most extensive public participation in the stock market in all financial history. The present situation is unique in many respects and experience offers little guidance.

Stock Market Somersaults

It is no easy matter to discuss the stock market in an article written, as this is, several days before publication and at a time when the market is daily doing somersaults of one kind or another. Perhaps before these lines are published the answer will be given to the questions that are now under discussion. These are, briefly, whether further stock value expansion and further industrial expansion may seriously curtail the credit available for business; and what the effect of deflation of stock market values will be.

1928
Estimated Total Motor Vehicle Production

United States and Canada

4,640,000

Passenger Cars		Trucks	
Estimated United States and Canadian Production	4,050,000	Estimated United States and Canadian Production	590,000
Estimated Canadian Production	201,000	Estimated Canadian Production	50,000
Estimated United States Production	3,849,000	Estimated United States Production	540,000
Estimated United States Domestic Sales	3,220,000	Estimated United States Domestic Sales	340,000
Estimated Exports and Stocks Increase	629,000	Estimated Exports and Stocks Increase	200,000
Estimated Exports and Foreign Assemblies	430,000	Estimated Exports and Foreign Assemblies	152,000
Estimated Increase Dealer Stocks	199,000	Estimated Increase Dealer Stocks	48,000

This table shows approximately how 1928 car and truck sales turned out. Estimates are involved in the figures as regards the last two months, but major changes from the figures given are not expected in the final tabulations which will be available in the Statistical Issue of Automotive Industries, Feb. 23, 1929

Business thus far has been well taken care of by the banking system and, in the absence of any developments of an unexpected character, the same should hold true for several months to come, at the very least. Commercial loans are carrying a much lower rate of interest than those on stock market collateral. This in itself is a highly unusual condition, but readily explainable. Commercial loans are eligible for discount with the Federal Reserve banks, and the others are not. Thus the still unstrained resources of the central banking system are available for the legitimate needs of business and the automobile dealer need feel no apprehension on this score.

Decline Would Release Credit

A severe and permanent decline in the stock market would, of course, release credit, and could be brought about, in view of the adequately margined accounts now demanded by brokers and the conservative loans of the banks, without serious consequences to any except the individual speculators unfortunate enough to be caught in a bad position.

This introduces a topic of considerable interest—the effect of stock market profits on automobile buying. It is conceivable that the wiping out of paper profits on a large scale might perceptibly affect buying and result in a pronounced upturn in repossessions. A warning to the latter effect was given by a banker at the recent meeting of the National Association of Finance Companies.

On the other hand, some rather severe declines have interrupted the progress of the bull market in recent years and the automobile trade did not suffer. Despite the large number of persons now interested in stock trading, as opposed to investing, it is likely that they are a rather small proportion of the huge army of motor car buyers and are negligible so far as low-priced cars are concerned.

So, even the credit situation, despite its uncertainties, does not appear to threaten seriously the onward march of prosperity.

For those close analysts who like to work out similar estimates for themselves, a few comments on the building of the 1929 estimates may be interesting and helpful.

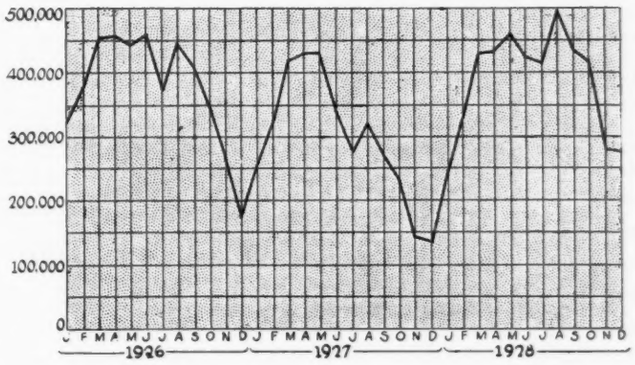
To begin with, the assumption was made that in 1929 there would be a reasonable balance between total output and total retail sales. If actual domestic retail car sales, for example, run higher than 3,365,000 and total car output is approximately 4,115,000 as estimated, then dealer car stocks will be diminished during the year. If, on the other hand, domestic car sales fall below 3,365,000 and production stands at 4,115,000—as seems more likely—then dealers' car stocks again will show a net increase for the year.

Export Estimate Liberal

The estimated figures for export and foreign assembly sales for both cars and trucks is believed to be liberal rather than conservative, since a very good percentage of increase has been allowed over 1928 in both instances—an increase large enough to take care of reasonable expectations even in this rapidly growing phase of the automotive field.

If total production were to be predicted on the basis of announced plans of individual manufacturers, the estimate would have to be in the neighborhood of 7,000,000 motor vehicles for 1929—and there is every indication that the industry has sufficient production capacity to enable it to build that number of vehicles if markets for them could be found. Even with business conditions continuing good, however, and with sales at home and abroad continuing to go ahead at a good pace and with increased number of scrapped cars to be replaced by new ones, it is difficult to see how the industry is going to put into customers' hands much more than four and a half million cars and trucks in 1929. That means that some makers are not going to realize the sales which they now hope for and expect.

Three Years' Production



This chart pictures total motor vehicle production in United States and Canada by months for the years 1926, 1927 and 1928. The figure for December, 1928, is estimated

New Belgian Straight-Eight

THE Minerva Co., the biggest producer in Belgium, has recently carried out improvements on its 122 cu. in. light six, these comprising a double Zenith carburetor having a horizontal float and external manifold; positive lubrication to the top of the sleeves of this Knight engine, and an oil radiator combined with the water radiator. The left-hand strip of the radiator receives the lubricating oil, which is taken off the main circulating system. A cock is fitted on the outlet pipe from the engine to shut off the flow through the radiator in winter.

A new straight-eight of 63 by 94 mm. bore and stroke was shown at the recent Belgian show by A.D.K., one of the smaller Belgian firms. It is on normal lines, with overhead valves operated by pushrods and rockers, unit engine and transmission and four-wheel mechanical brakes with Dewandre servo mechanism.

Several Belgian firms are devoting themselves to truck production to the exclusion of passenger cars for, with only a few exceptions, American makers are not showing activity in this field. The Pipe Co. has a producer gas tractor with a six-cylinder overhead valve engine of 120 by 160 mm. bore and stroke, which carries 2½ tons useful load and hauls four trailers, each with a 5-ton load; the total useful load is thus 22½ tons. This tractor is designed for service in the Belgian Congo.

Belgian body styles this year do not reveal any startling changes. The most prevalent body line is one which, when seen in cross-section, is rounded from the running board to the waist line and perfectly straight from this point upward. Valences between body and running board are rarely seen and on large numbers of Belgian cars the molding on the door edges has been abolished. The vertical post between front and rear doors is made very thin and in some cases it has been abolished, a duplicate hinge being used which carries both doors.

Leaders *of* Industry Envisage

New production records anticipated by car and truck manufacturers. Fundamental conditions sound.

THE comments presented here on the busi *Industries* in response to a questionnaire ing the sentiment of business leaders. Optimism truck manufacturers, parts and accessory mak ment men, all are unanimous in the belief that volume of automotive business during the com

A. R. ERSKINE, president, Studebaker Corp. of America: While nobody can foresee the future a year ahead, and I regard production estimates for such an extended period as pure guesswork, I fix 5,000,000 vehicles as my guess. This means that I am very optimistic over the outlook for 1929.

Alfred P. Sloan, Jr., president, General Motors Corp.: I believe the production of motor cars in 1929 will reach a satisfactory total. As a matter of fact, I look forward to a new record being established. The normal trend will call for increased production, due to increased replacement demand plus increased demand from overseas markets.

F. E. Moskovics, president, Stutz Motor Car Co. of America, Inc.: I believe that for those manufacturers who offer real value and real improvements, 1929 will be a record year. I think actual business will exceed that of 1928.

John N. Willys, president, Willys-Overland Co.: In my judgment the automobile industry will pass the 5,000,000 mark in 1929. This opinion is based on an expectation of at least maintaining present domestic levels and a great increase in export trade.

H. H. Franklin, president, H. H. Franklin Mfg. Co.: With the continuance of American prosperity, increasing penetration of foreign markets and better values than ever before in 1929 motor car offerings, the industry has every reason to anticipate another increase in output which will overtop 1928. Increasing sales activity will also expand the total volume.

Alvan Macauley, president, Packard Motor Car Co.: I am very hopeful that 1929 will establish an all-time record in motor car production and distribution. Fundamental conditions are sound; motor cars offer a far better value than ever before for the price asked, and the demand for automobiles, even in America, is far from satisfied. The motor car is forever out of the luxury class. It is known now to be a wealth producer and largely responsible for America's unprecedented prosperity.

R. S. Cole, vice-president, Hupp Motor Car Corp.: In our opinion, with all of the lower price car manufacturers in production, the volume for 1929 will be greater than 1928. The outlook for manufacturers of medium and high-priced lines will depend upon the reputation and success of their product and its eye appeal to the buying public.

Roy H. Faulkner, vice-president in charge of sales, Auburn Automobile Co.: While 1929 promises to be a most highly competitive year, I believe value rather than price will be the determining factor in most sales. I also believe that total production will exceed that of any previous year.

Edward S. Jordan, president, Jordan Motor Car Co.: Motor vehicle production in 1929 should exceed all previous years.

Carl W. Burst, vice-president, Moon Motor Car Co.: Present prosperity of dealers, the close cooperation between factories and dealer organizations and the ever-constant improvements being introduced by motor car manufacturers, will go to make 1929 production unquestionably equal to if it does not exceed that of 1928.

E. J. Bartlett, president, Baker-Raulang Co.: The outlook for body business is good for at least the first half of 1929, or about the same as the last half and better than the first half of 1928.

James Cunningham, Son & Co.: An increase in production over 1928 is planned for next year. The prosperous condition of this country and also the increasing preference shown by foreign countries for American cars make the outlook very satisfactory.

S. J. Marshall, president, Larrabee-Deyo Motor Truck Co.: The continuous steady growth of the industry under varying business conditions of other years insures new high production records in 1929. The outlook is that 1929 will be the greatest year for the automotive industry, and especially for the commercial vehicle branch.

T. R. Lippard, president, Stewart Motor Corp.: I am confident that the 1929 output of passenger cars and trucks will exceed 5,000,000. The outlook for the truck industry is unusually bright.

The Maccar Corp.: Sales in 1929 undoubtedly will be good. In our own particular case we look for a 50 per cent increase.

B. A. Gramm, president, Gramm Motors, Inc.: I believe that total motor vehicle production in 1929 will be 750,000 greater than in 1928, with exports taking 25 per cent of the increase. The outlook is sound. Enthusiasm will go far in putting over a prosperous year.

S. Duncan Black, Black & Decker Mfg. Co.: We think the outlook for 1929 is for a normal shop equipment business. Increasing requirements of the aviation industry should help; also the increase in realization on the part of the driving public of the advan-

1929 *as* 5,000,000-Car Year

ness outlook for 1929 were wired to *Automotive* circulated for the purpose of quickly determin- is the keynote of the replies. Passenger car and ers, body builders, machine tool and shop equip- conditions are favorable for an unprecedented ing year.—*Editor.*

Parts and accessories plants keyed up for greatest volume in history. Body builders optimistic.

tages of keeping engines in condition should stimulate service equipment business.

Edward G. Budd, Budd Mfg. Co.: It is our belief that next year will be an entirely satisfactory one for the automobile industry. As far as our company is concerned, there is every prospect that it will be the biggest year in our history.

C. O. Miniger, president, Electric Auto-Lite Co.: The year just closed, while noted for narrow profit margins, has been, because of large volume, a satisfactory year for parts makers. The outlook for 1929 is bright but keen competition will still further affect margin and those companies which show a satisfactory profit will have worked harder than in previous years. Costs must be reduced, inventories held down and all funds profitably employed. It is a gratification to me that in spite of present conditions our quality has been better than ever.

S. G. Down, vice-president, Westinghouse Air Brake Co.: The 1929 horizon for the automotive industry looks clear and holds promise of exceeding all past records. The public appreciates and responds to the improvements being made in detail features which contribute to comfort and safety. With higher general average speeds and more congested traffic, the brake details will necessarily attract and receive considerable consideration and we anticipate a very active year.

W. L. O'Neill, vice-president, Stromberg Motor Devices Co.: I have never seen prospects for the automobile accessory business look brighter than they do for 1929. The increased production of the various manufacturers, together with the extraordinary sales efforts being put forth, should cause more cars to be sold in 1929 than in any previous year.

H. J. Hater, Aluminum Industries, Inc.: We estimate that new car production for 1929 will be close to 5,000,000 cars. While our business has shown a 20 per cent increase in 1928 over 1927, we anticipate and are preparing for an increase of 30 per cent for 1929 over 1928.

H. W. Schnetzky, president, Wisconsin Motor Co.: I feel very optimistic in regard to business prospects for 1929. We already have amplte orders on our books to back up this optimism.

L. M. Wainwright, president, Diamond Chain & Mfg. Co.: Indications are very definite for a continuance of the present trend toward an increase in business for the coming year.

Eugene B. Clark, president, Clark Equipment Co.: 1929 looks like another splendid year. This tells the story as I see it.

H. G. Jackson, president, Wire Wheel Corp. of America: There is every indication of increased business for automotive parts and accessory manufacturers in 1929. We have increased our facilities so as to manufacture 100 per cent more Buffalo wire wheels next season. Orders now on our books justify us in planning for this greatly increased volume of business.

Charles B. Bohn, president, Bohn Aluminum & Brass Corp.: Our opinion is that the first six months of 1929 will see bigger and better business for automotive manufacturers and parts suppliers.

W. H. Beal, vice-president, Lycoming Mfg. Co.: One of the indications of how the automobile manufacturers regard 1929 is that every one of the companies using our engines has increased its contracts for the coming year over 1928. In two instances, 1929 contracts call for practically double the number of engines used in 1928. Our program calls for nearly twice the number of units for the coming year over 1928.

Ralph E. Carpenter, vice-president, Spicer Mfg. Corp.: The outlook for next year is very satisfactory.

Young Radiator Co.: The 1929 outlook for the automotive industry is very promising. We have more orders on file at the present time than in any previous period.

Western Felt Works: Our business has reached the highest peak in history and indications point to an even larger volume in 1929.

Columbia Axle Co.: The outlook for the next year is most promising.

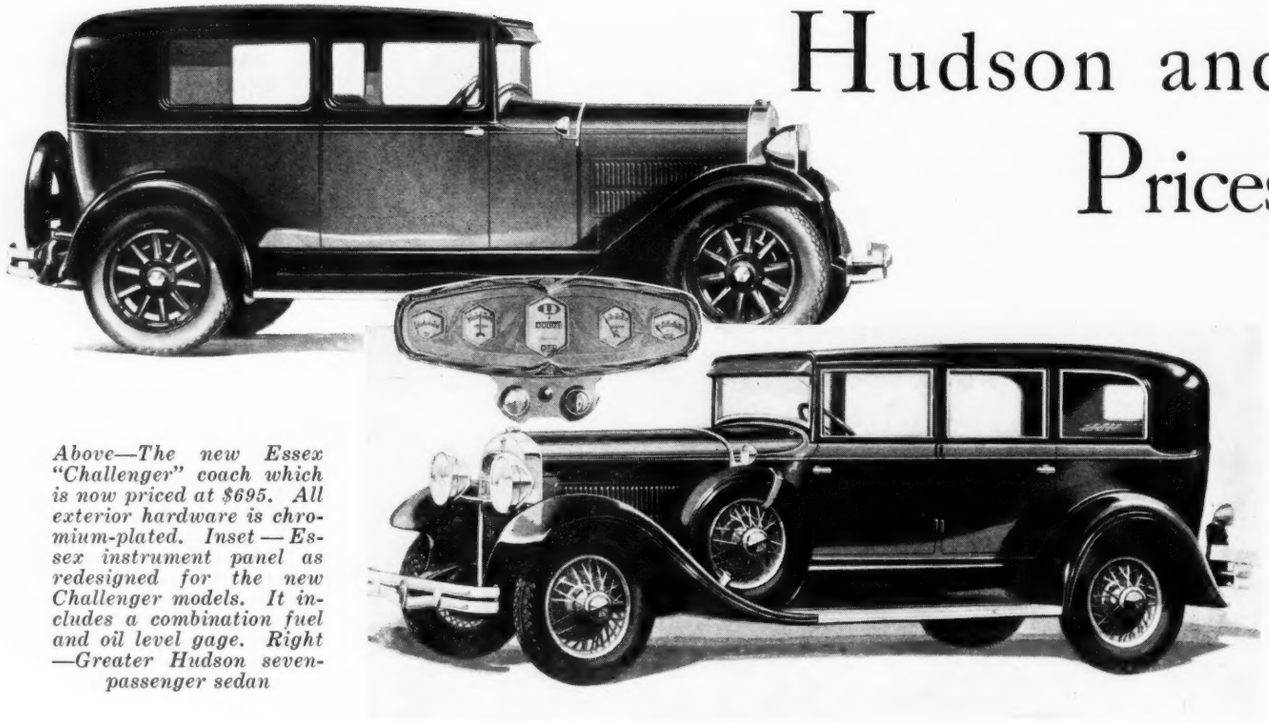
Jaxon Steel Products Co.: As we close a most successful year, the prospects for 1929 look to be for an even greater volume. Schedules for early winter are very satisfactory and export trade will show a tremendous increase.

Ross Gear & Tool Co.: Our outlook for 1929 is especially good. We are preparing for a 50 per cent increase in production.

H. W. Chapin, president, Brown-Lipe-Chapin Co.: In my opinion the automotive outlook for 1929 is unusually bright. Judging from orders for differential gears placed with us, our customers are planning for a big season.

Kenneth A. Spurgeon, Muncie Gear Works: In our opinion the outlook for 1929 in the parts and accessory field is very bright. *(Continued on page 949)*

Hudson and Prices



Above—The new Essex "Challenger" coach which is now priced at $695. All exterior hardware is chromium-plated. Inset—Essex instrument panel as redesigned for the new Challenger models. It includes a combination fuel and oil level gage. Right—Greater Hudson seven-passenger sedan

HUDSON MOTOR CAR CO. has made extensive alterations in both of its lines of cars, which are now designated as the Essex Challenger and the Greater Hudson. A 25 per cent increase in engine horsepower is the most notable change in the Essex, while the Hudson has been greatly increased in size, the wheelbase of the longer models having been increased by 12 in., and the tread widened at the same time.

As previously, the Hudson is made in two lengths of wheelbase, and the product of the company therefore consists really of three distinct lines. New types have been added to each of these lines, and practically all prices have been reduced, most of them by substantial amounts.

Following is a complete list of both Essex and Hudson models, with old as well as new prices:

Essex	New Price	Old Price
Coach	$695	$735
2-pass. coupe	695	New Model
5-pass. phaeton	695	750
Rumble seat coupe	725	775
Standard sedan	795	Same
Town sedan	850	New Model
Roadster	850	Same
Convertible coupe	895	New Model
Hudson—122-in. Wheelbase		
Coach	$1,095	$1,250
Standard sedan	1,175	1,325
Rumble seat coupe	1,195	1,295
Roadster	1,250	1,295
Phaeton	1,350	New Model
Town sedan	1,375	New Model
Convertible coupe	1,450	New Model
Landau sedan	1,500	1,650
Victoria	1,500	1,650
Hudson—139-in. Wheelbase		
Sport phaeton	Not Announced	$1,650
5-pass. sport sedan	$1,850	New Model
7-pass. sedan	2,000	1,950
7-pass. limousine	2,100	New Model

The new Essex models differ materially in appearance from the 1928 series, having added belt molding, two horizontal groups of paneled louvres, a higher hood, a new radiator outline and new fenders. The engine is much more powerful and the acceleration of the car is said to be substantially the same as that of the 1928 model Hudson. Body widths have been increased 3 in., which, with better shock-absorbing equipment and adjustable front seats, has added materially to the comfort of the cars. The line has been rounded out by the addition of a town sedan and a convertible coupe.

The increased output of the engine is due chiefly to operation at higher speed, for the bore has been increased only 1/16 in., to 2¾ in., which with a stroke of 4½ in. gives a displacement of 161.4 cu. in. Whereas last year the engine was rated at 44 hp. at 3000 r.p.m., the rating now is 55 hp. at 3600 r.p.m. The valve lift has been increased 1/32 in. and the compression ratio to 5.75 to 1. The chief gain, however, is due to improved carburetion and manifolding. A Marvel 1⅛-in. air-valve-type of carburetor is now fitted, and is provided with means for automatically regulating the heat supply, by interconnecting the butterfly heat-control valve with the throttle control. The heat control can be separately adjusted to compensate for changes in atmospheric temperature.

Accelerator Well in Carburetor

The carburetor is fitted with an accelerator well, which is intended primarily for winter use, a finger control being provided to permit of rendering it inoperative in warm weather, for the sake of fuel economy. The choke control is semi-automatic; choke and throttle controls are interconnected, and a thermostat further aids in preventing over-choking after the engine has warmed up.

With a small engine like the Essex, if a large inlet manifold is used the problem of preventing condensation of the fuel in the manifold arises. Hot-water jacketing of the manifold was introduced last year, and this year, in addition, the manifold is internally finned, to direct the fuel flow more accurately and prevent backward surges. Connections to all inlet ports are the same distance from the carburetor riser.

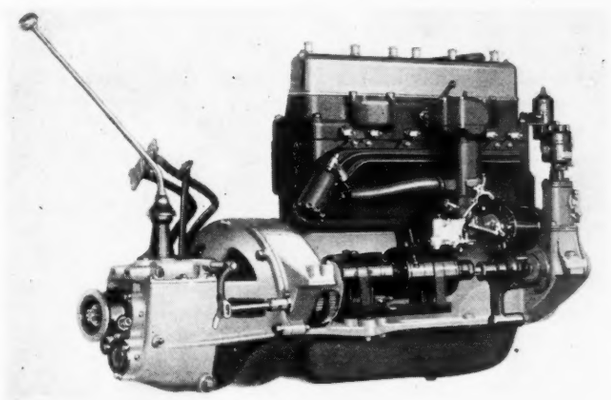
A "semi-baffling" wall and a new combustion-chamber contour direct the incoming gases over the exhaust valve

Essex Horsepower Increased, on Both Lines Reduced

Essex engine changed to give 25 per cent more power. Hudson wheelbase lengthened and tread widened.

By A. F. Denham

head before they enter the space over the piston. The spark plug is located at the hottest point of the compression chamber, near the exhaust valve, but further from the center of the combustion chamber, and locating the plug in this position is said to have permitted an increase of 0.5 in the compression ratio. In order to obtain a scavenging effect in that part of the combustion chamber over the inlet valve, which forms a recess, opening of the inlet valve is made to precede

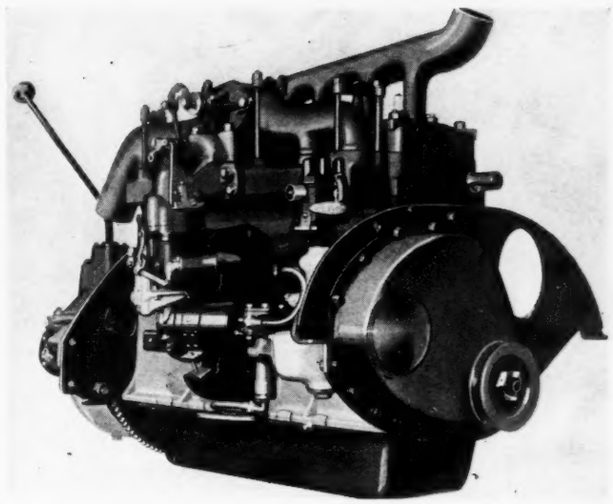


Carburetor side of Greater Hudson engine

closing of the exhaust valve by a considerable period. These changes in manifolding and in combustion chamber design also increased the low-speed torque of the engine.

To assure proper fuel supply at high speeds, a booster has been added to the Stewart-Warner vacuum tank. This tank also incorporates a visible, removable gasoline strainer.

Inside the engine there are a number of other changes. Valve cooling has been improved. The oil pump has been increased in capacity; a full double bottom crank pan is provided, making for easier cleaning of the lower pan; the spark is now set to occur 7½ deg. early in the full retard position; a new curve has been worked out for the cams, and a new oil groove system has been applied to the connecting rod lower end bearings, which is claimed to increase the lubricating efficiency at this point. The engine is now ventilated through the valve chamber and front end chain case, instead of through the rear of the block. Rubber mounting bushings are now used at all four points of support, and in connection with this latter change a strip-steel cross-member has been added just back of the rear engine supports.



Valve side of Essex Challenger engine

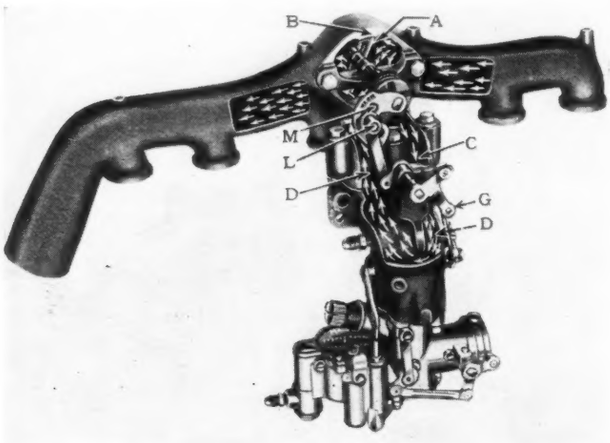
In the chassis there are only few changes. The rear axle has been changed to a 56⅛-in. tread, to accommodate the wider bodies. Bendix brakes of the two-shoe type which are self-energizing for both directions of motion have been adopted. Both shoes float. Adjustment is made by means of a ratchet wheel operating a double-threaded screw at the ends of the shoes opposite to the cam. This wheel can be reached with a screw driver or similar tool through a hole in the brake cover plate. The usual eccentric pin adjustment for larger movement is also provided, and is externally operated. All equalizers have been eliminated. Molded lining is used, 1½ in. wide and 5/32 in. thick. The rear wheel service brakes are also used for emergency braking.

Steering Gear Ratio Increased

In the Gemmer steering gear the column jacket is now carried straight through to the gear housing and the ratio has been increased to 15 to 1. The worm shaft is now carried on Timken roller bearings. Ball and socket joints are now used for the tie rod ends. Other chassis changes include an increase in radiator cooling area, an increase in the capacity of the cooling system to 4¾ gal., provision of Alemite chassis lubrication fittings instead of the oil cups with wick feed, formerly used; provision of a universal joint cover; a new welded muffler with four sieve-type hemispherical baffle plates, and integral bumper brackets. All exposed chassis parts are finished in pyroxylin lacquer.

All closed bodies have fully adjustable crank-operated front seats, including the driver's seat on the two-door model, and adjustable steering columns. A combination

dash gasoline and oil level gage of the electric type are included in the equipment. Under normal conditions the gage registers the amount of gasoline in the tank. If a button on the dash is depressed, however, a switch is closed in a circuit through a rheostat operated by a float-type oil-level gage, and the gage then registers the amount of oil, the gas tank electrical circuit having been opened.



Essex fuel distribution system

All exterior hardware is now chromium-plated. Radiator shutters, as formerly, are hand-controlled and are to be colored to harmonize with body finish. The radiator shell has been extended downward and a false bottom, matching the shutters, provided. The radiator filler cap, the crank hole cover, and the hub caps are of a new flat prismatic type. Vision has been improved by further reducing the width of the front corner pillars. Floor boards are of plywood.

Standard equipment includes Monroe hydraulic shock absorbers all around, carburetor air cleaner, an improved Electrolock ignition switch, double filament headlights, cowl ventilator, engine thermometer, rear view mirror, automatic windshield wiper and stop light.

"Larger and more powerful" briefly characterizes the new Hudson models. Wheelbases have been increased from 118 and 127 in. to 122½ and 139 in. This lengthening of wheelbases has added 4 in. to the legroom provided, while an increase in rear-wheel tread to 57½ in. has made it possible to widen the seats by 3 in.

New Hood and Radiator Treatment

The appearance of the cars has been changed by a new hood and radiator treatment and by the provision of a new type of belt molding. The engine power has been increased slightly by improving the carburetion; the clutch now has a spring-cushion drive, and Bendix two-shoe brakes are used, which are self-energizing in both directions.

Many of the changes made in the Essex are duplicated in the new Hudson. Thus the hood treatment and radiator outline are quite similar, all exterior hardware is chromium-plated, front bumper brackets are integral with the frame horns and rear bumper brackets with the rear cross-member of the frame.

Both front and rear seats are adjustable, corner posts are narrower for better vision, floor boards are of five-ply wood, windows are larger and spare tires are carried in wells in the front fenders, each being provided with a locking clamp.

There is also considerable similarity between the mechanical changes made in the two lines. Thus the new double-jet Marvel carburetor on the Hudson has the same features of choke control as on the Essex, the valve lift has been increased to ⅜ in. for the inlet and 9/64 in. for the exhaust; the combustion chamber has been altered slightly, the compression ratio having been raised to 6.0 to 1, in spite of which high compression the use of standard fuels is recommended. These changes combine to increase the brake horsepower to 91 at 3200 r.p.m. An increase in torque, especially at low speeds, has been obtained also. As on the Essex, a booster and visible fuel strainer are built into the vacuum tank.

The oil pump has been enlarged, and lubrication of the overhead inlet valves has been improved by passing oil vapor through two passages drilled from the valve chamber at the side of the engine. The "oil-retaining" bearings adopted on both cars recently have been retained, and a two-piece splash pan is adopted on the Hudson also. The fan is now a two-piece instead of a four-piece construction.

Clutch Plates are Larger

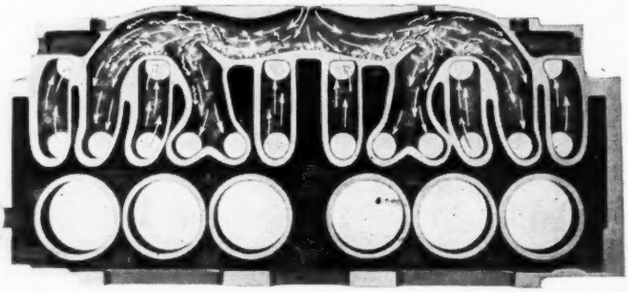
While the cork-insert-design of clutch has been retained, the diameter of the plates has been increased, and a cushion spring has been incorporated in the plate. Universal joints are now lubricated through an opening in the propeller shaft, while chassis lubrication is by Alemite fittings, instead of by the wick-feed oil cups formerly used. Water passages in the radiator have been enlarged.

Steering gear changes are similar to those on the Essex and consist of an increase in ratio from 18 to 20, adoption of roller bearings for both worm shaft and disks, universal-jointed tie rods, and a full-length jacket tube for the column.

Brakes are also similar in design to those on the Essex, but larger. In the Hudson models an additional feature consists in mounting the brake cross-shaft ends in their brackets between three rollers, one of which has an eccentric adjustment. This makes it possible to free the shaft if it should bind.

Front springs are flat and are shackled directly below the frame side-rails. No provision is made to allow for twist, the object being to reduce shimmy possibilities. Further chassis changes include a new muffler similar to that on the Essex and the provision of a splash oil deflector on the cover of the rear axle center housing, for more positive lubrication.

Standard equipment on all models includes the same type electric oil and gasoline level gage used on the Essex, AC air cleaner, cowl ventilator, adjustable steering column and seats, engine thermometer, improved Electrolock, Trico windshield wiper, Wahl double-acting hydraulic shock absorbers, combination tail and stop-light, shatter-proof glass in windshields, and trunk racks.



Cutaway view of Essex cylinder head, showing integral manifolding

Registration Reaches 24,384,488

Estimate as of Dec. 31, 1928, shows increase of 1,131,000 motor vehicles since last year. Replacement sales heavy.

A REGISTRATION estimate just completed by *Automotive Industries* indicates that on Dec. 31, 1928, there will be registered in the United States 24,384,488 motor vehicles, made up of 21,202,293 passenger cars, 3,091,062 motor trucks and, in the 23 states which segregate the figures, 91,133 buses. Total license fees received will be about $301,607,393 while gasoline taxes total approximately $280,269,557.

The increase in registrations is about 1,131,000, while total sales of cars and trucks during 1928 will probably be about 3,560,000, indicating that the replacement market approximated 2,400,000 vehicles.

For the first time a state—New York—tops the 2,000,000 mark in vehicles registered. The increase in registrations of slightly less than 5 per cent has been fairly well distributed throughout the country.

Motor Vehicle Registrations—December 31, 1928

	CARS	TRUCKS	BUS	TOTAL	CYCLES	LICENSE FEES	GASOLINE TAX
Alabama	218,335	36,238	666	255,239	611	$3,494,243	$6,431,304
Arizona	83,893	7,710	197	91,800	317	450,000	2,050,799
Arkansas	181,334	36,626	*	214,960	515	4,000,000	4,308,952
California	1,511,544	220,034	*	1,731,578	9,444	8,746,874	33,000,000
Colorado	219,377	18,995	90	238,462	1,163	1,796,649	4,098,507
Connecticut	266,442	48,029	763	315,234	3,574	5,729,022	3,350,000
Delaware	41,196	10,051	*	51,247	300	940,000	726,000
District of Columbia	130,470	15,711	*	146,181	1,100	146,000	1,030,000
Florida	275,594	51,802	*	327,396	1,347	4,919,640	11,122,013
Georgia	277,639	40,215	*	317,854	1,076	4,048,465	8,250,000
Idaho	92,274	11,657	*	108,931	400	1,657,310	2,000,000
Illinois	1,313,067	190,000	*	1,503,067	5,800	15,510,091	None
Indiana	721,000	120,500	1,030	842,530	3,110	5,692,470	11,404,340
Iowa	668,537	60,955	*	729,492	1,727	10,688,379	9,063,508
Kansas	455,000	55,000	*	510,000	1,200	5,099,000	5,115,000
Kentucky	275,068	31,743	*	306,811	722	4,568,393	6,000,000
Louisiana	237,000	40,000	*	277,000	725	4,341,263	3,281,029
Maine	138,409	28,212	*	166,621	910	2,720,650	3,250,000
Maryland	246,440	8,177	706	255,323	2,177	3,041,043	5,530,338
Massachusetts	662,406	85,068	1,725	749,199	6,701	13,438,941	None
Michigan	1,082,713	165,367	*	1,248,080	3,500	15,800,000	15,000,000
Minnesota	573,395	88,805	347	662,547	71	10,141,665	5,250,000
Mississippi	204,694	31,132	*	235,826	80	353,000	4,860,000
Missouri	618,000	72,000	*	690,000	1,800	8,350,000	6,000,000
Montana	103,949	21,969	*	125,918	193	1,795,884	950,000
Nebraska	347,746	28,069	157	375,972	860	3,691,636	3,752,591
Nevada	21,585	5,549	*	27,134	90	242,000	532,000
New Hampshire	88,702	14,048	*	102,750	1,299	1,936,272	1,495,741
New Jersey	624,532	129,046	10,439	764,017	6,628	13,538,688	8,324,806
New Mexico	65,180	2,463	*	67,643	170	570,000	676,000
New York	1,705,702	333,755	†54,335	2,093,792	15,825	34,808,231	None
North Carolina	442,000	44,000	*	486,000	900	3,850,000	5,580,000
North Dakota	174,500	21,700	*	196,200	270	1,950,000	2,050,000
Ohio	1,460,000	202,000	*	1,662,000	7,500	11,807,209	25,000,000
Oklahoma	526,563	57,783	1,000	585,346	1,000	6,268,918	4,750,000
Oregon	231,371	21,981	975	254,327	2,024	6,976,428	4,117,407
Pennsylvania	1,408,608	221,884	8,373	1,638,865	13,800	26,513,105	20,000,000
Rhode Island	80,661	14,381	376	95,418	1,162	2,203,271	1,188,500
South Carolina	194,968	23,000	88	218,056	435	2,480,000	5,350,000
South Dakota	170,458	20,025	*	190,483	230	2,900,000	3,060,000
Tennessee	288,369	27,560	1,750	317,679	890	4,100,000	5,000,000
Texas	1,047,093	151,634	5,709	1,204,436	3,333	10,005,643	9,514,484
Utah	84,220	14,321	*	98,541	520	731,340	1,918,131
Vermont	78,372	7,575	111	86,058	520	2,090,516	1,077,426
Virginia	304,000	54,000	633	358,633	1,900	5,500,000	9,065,000
Washington	344,421	57,875	463	402,759	2,734	6,526,010	3,844,659
West Virginia	217,846	35,936	658	254,440	1,479	4,103,009	4,158,022
Wisconsin	648,633	97,083	542	746,258	2,901	10,781,135	6,928,000
Wyoming	48,987	7,398	*	56,385	131	565,000	815,000
Total	21,202,293	3,091,062	91,133	24,384,488	115,164	$301,607,393	$280,269,557

† Includes Taxis.
* Not segregated.

Five-Speed Cotta Transmission *Controlled* by One Lever

Device of continuous mesh type has all shafts arranged in same horizontal plane. Furnished in two models for truck and bus use. Designed for frame mounting.

COTTA GEAR CO., 117-129 Morgan St., Rockford, Ill., has recently placed on the market a five-speed transmission for trucks and buses, which, besides being of the Cotta continuous mesh type, possesses the feature that the control is entirely by one lever, which

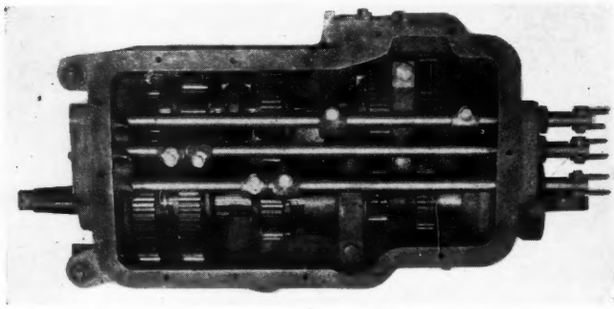


Fig. 1—Photograph of Cotta Gear Co.'s five-speed transmission with cover removed

is unusual for a transmission with more than four forward speeds.

All shafts are arranged in the same horizontal plane, which is often more convenient in a commercial vehicle. The transmission is made in two models, one with direct drive on high (this being referred to as the standard model), the other with an indirect overgeared fifth speed. Reduction ratios for the different speeds of the two models are as follows:

Gear Speed	Standard Model	Over-geared Model
First	8.33 to 1	8.33 to 1
Second	4.75 to 1	3.45 to 1
Third	2.80 to 1	1.75 to 1
Fourth	1.60 to 1	1 to 1
Fifth	1 to 1	1 to 0.72
Low reverse	11 to 1	11 to 1
High reverse	6.30 to 1	5.40 to 1

The transmission is made in two capacities. Model 65 will take care of a maximum engine torque of 280 lb.-ft., while Model 55 will take care of 230 lb.-ft.

An inspection of the horizontal sectional view will reveal that there are two first reduction pairs of gears, one giving a reduction of 36 to 18 and the other of 42 to 12. Both of the pinions are fast on the primary shaft, and they constantly remain in mesh with their respective gears, which are mounted free on bushings on the secondary shaft. Each of these gears can be locked on the secondary shaft by means of a jaw clutch sliding on splines on this shaft.

The primary shaft is mounted in one annular ball and one flexible roller bearing, and both pinions are between bearings and do not overhang. From the secondary shaft the power is transmitted to the tailshaft for forward motion through one or the other of two pairs of gears, of which the driving member is normally free on the secondary shaft. Between these two secondary shaft pinions there is a positive clutch which is keyed to the shaft, and by moving either pinion toward this clutch, it can be locked on the shaft. The gears on the tailshaft are splined thereon, and when the pinion is moved on the secondary shaft, the corresponding gear moves with it, so that there is at all times full-face tooth contact. For the reverse speeds there is a pinion integral with the secondary shaft adjacent to its rear bearing, which drives through an intermediate reverse idler to a gear which is rotably mounted on the tailshaft but can be locked thereon by a positive clutch. The direct drive is obtained by locking the primary shaft and tailshaft together by means of a positive clutch which is located immediately back of the intermediate bearing.

This transmission is designed for frame mounting, and a separate control assembly goes with it. In the transmission housing there are three slider bars, of which one controls the high and low reductions, another the low reverse and first and second speeds, and

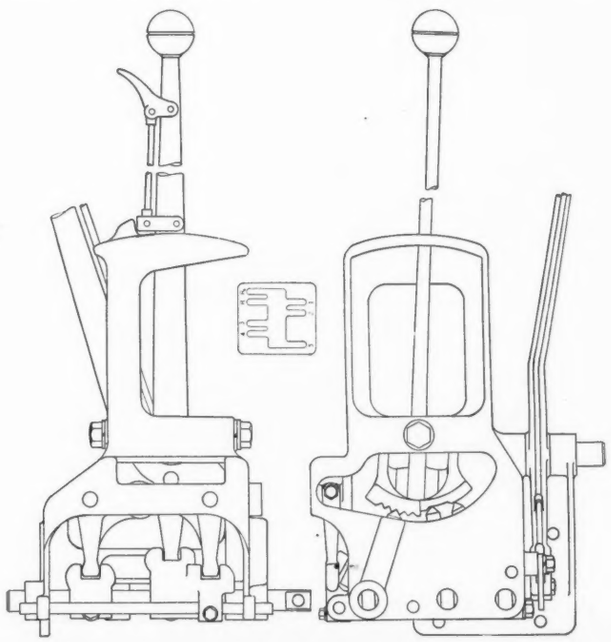


Fig. 2—Control unit of Cotta Gear Co.'s five-speed transmission with gear shift lever position diagram

the third the high reverse, third, fourth and fifth speeds.

The shift lever has a compound motion—transverse and fore-and-aft. When it is moved transversely it engages with and drops the different slider bars, while a fore-and-aft motion of the lever results in a sliding motion of the slider bars to which it happens to be connected by reason of its transverse position. The peculiarity of the new Cotta transmission resides in the fact that the shift lever connects with two of the slider bars through the intermediary of bell cranks; there are two bell cranks for each of these slider bars, and the same motion of the shift lever will move the slider bar in one direction or the other according to which of the bell-cranks transmits the motion.

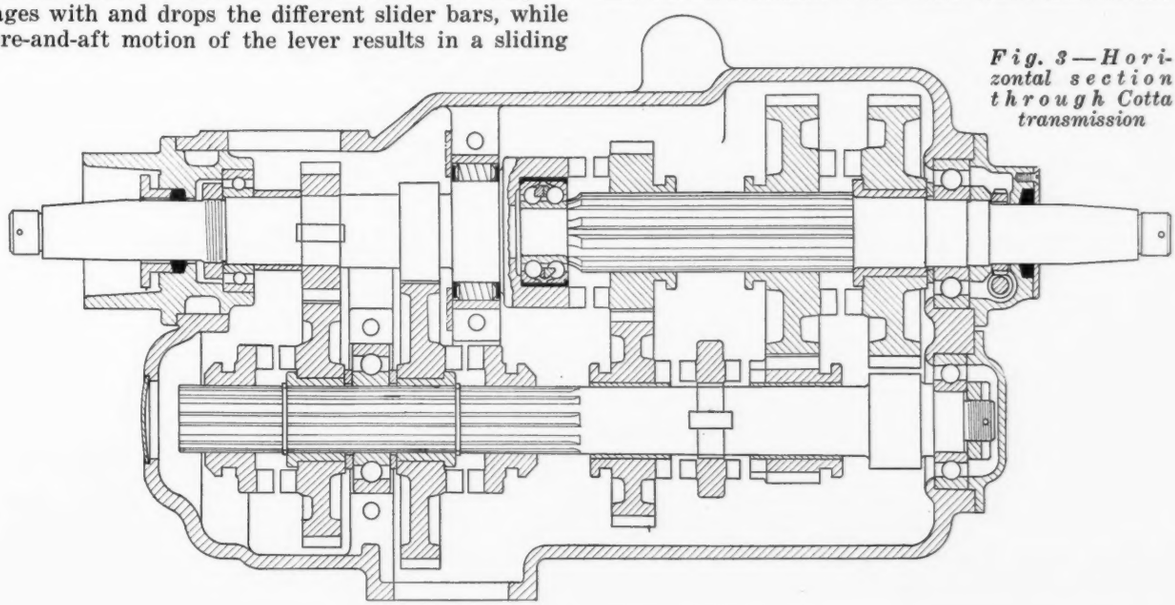


Fig. 3—Horizontal section through Cotta transmission

The shift lever moves in a "gate," a drawing of which is shown in the illustration of the control mechanism. Now suppose the shift lever to be in the neutral position at the extreme right (or top as shown in the figure) in the transverse slot. The lever is then engaged directly with the slider bar connected with the pair of sliding gears near the rear end of the box, and also, through the intermediary of a bell-crank, with the slider bar connecting to the two positive clutches for the first reduction gears (on the secondary shaft at the forward end).

When Lever is Shifted Forward

If now the lever is shifted forward, into the slot marked R_1 (see Fig. 2), the slider bar engaged directly by its downward extension will move backward, and this will cause the rear set of sliding gears in the gearbox to be moved toward the rear, and as a result the reverse gear to be locked to the tailshaft. Through the bell-crank the two clutches on the secondary shaft near the forward end will be moved forward, whereby the first reduction gear giving the largest reduction is locked to the secondary shaft. The power is then transmitted through the large reduction first reduction gears to the secondary shaft, and thence through the reverse gear train of three gears to the tailshaft.

Now suppose that the shift lever, after being returned to the neutral position, is shifted slightly toward the left, until it is opposite the slot marked *R*. It still remains in engagement with the slider bar connected to the pair of sliding gears near the rear of the gearbox, and forward motion of the shift lever into slot *R* will lock the reverse gear to the tailshaft exactly as in the previous case. However, the shift lever now engages the slider bar connected to the clutches for the first reduction gears through the other bell-crank, and forward motion of the lever will result in moving these clutches rearwardly, engaging the pair of first reduction gears giving the smaller reduction ratio.

It will be noticed that the slot for the first forward speed is directly opposite the slot for the small-reduction reverse speed, and if the shift lever is moved backward into the first speel slot, the results are that the pair of sliding gears near the rear of the gearbox are moved to their extreme forward position, thereby locking the pinion on the secondary shaft, and the clutches of the first reduction gears also are moved forward, thereby engaging the first reduction gears giving the greatest reduction.

In this manner, whenever the shift lever is moved into one of the slots of the gate, two slider bars and the connected gears or clutches are moved, except in the case of the direct drive slot, when the clutches for the first reduction gears remain in the neutral position and the smaller of the two sliding gears on the tailshaft is moved forward to lock the primary shaft to the tailshaft.

All slider bars when in the neutral position are locked there by means of spring plungers engaging into slots in the bars. A reverse safety latch is provided, which makes it impossible for the driver to shift into reverse by mistake. To shift into reverse it is necessary to first lift the latch handle below the shift-lever ball handle with the finger.

ALUMINUM SOLDER CORP. OF AMERICA has been formed with headquarters in New York City to manufacture and distribute Soldalume, a new solder for aluminum and all of its alloys. Tests on specimens soldered with this solder have been made in the Testing Laboratories of Columbia University. Joints of duralumin to duralumin showed an ultimate tensile strength of 30,000 lb. p. sq. in.; butt joints of aluminum to aluminum showed 12,000 lb. p. sq. in., when the joint broke, but in some instances the joint did not break. Soldered joints after being subjected to a salt spray for two weeks showed no reduction in strength. Soldalume is a white powder which solders at 350-400 deg. Fahr.

Automotive Industries
December 29, 1928

Russia on Automo

Soviet authorities decide on ambitious program embracing large new plant for light cars and trucks. U. S. aid is invited.

By M. Sorokin

Chairman Soviet Automobile Trust

THIS is one of the few authoritative articles published in recent years on the automotive situation in Russia. It reveals for the first time the general details of the Soviet program for introducing motor vehicles into the country on a large scale through the establishment of a local industry, and pictures rather frankly the part which it is hoped the United States will play in the development.

Coming as it does from the pen of the highest automotive official in the Soviet Government, the article is stamped with an authenticity that makes it at once interesting and illuminating.

SOVIET Russia is on the eve of important developments in the automobile field. At present there are only about 20,000 motor cars in the whole of Russia, of which only about 12 per cent are privately owned. Our vast territory, with a population of 150,000,000 people determined to develop the immense natural resources of the country, has brought to the fore the problem of motor transportation as one of the most important tasks of the day.

We require hundreds of thousands of motor cars, which could be profitably utilized at the present time by various industrial and trading organizations.

Vast Potential Market

In order to appraise the potential market of motor cars in Russia, suffice it to say that we have over 15,000 industrial enterprises and over 100,000 cooperative centers scattered all over the country, whose business activities are greatly handicapped by the lack of transportation facilities. These are all potential users of motor cars and trucks. These figures could easily be augmented by the number of cars, motor buses and trucks which would find ready service in many of our cities and in interurban communication. For this reason the government has decided to embark upon more intensive motor vehicle development in the country.

The automobile industry in Russia is a new one. It is only five years since we started the actual production of trucks in the country. There are now five factories, of which four are in Moscow.

These plants manufacture 1½ and 3-ton trucks and also motor buses. Recently they have commenced production of a small four-passenger car. With few exceptions, all the material used in the manufacture comes from Russian sources. Our high-speed steel and automobile steel industries are also of recent origin, the manufacture of these products being non-existent before the revolution. As in any new industry, we are encountering many difficulties, but they are being gradually overcome by our engineers and workers.

However, the production of our own factories falls far short of meeting the demand. Besides, we need a light type of motor car and a 1-ton truck, at present not manufactured in the country, which would serve a purpose similar to the American mass production type of car. We have, therefore, decided on the construction of a large automobile factory for the manufacture of these light types of passenger cars and trucks, and on the enlargement of our existing factories. The new factory is to be erected in the near future, as soon as we have decided upon the type of car to be manufactured.

It is the general desire in Russia to select the car for this purpose in America, and we shall do so provided that we can come to terms acceptable to us with some responsible American automobile firm. American automobiles have already gained a firm foothold in the Soviet Union, since about a third of all the cars in operation in the country are of American manufacture.

The development of automobile manufacture in the Soviet Union, which will probably involve technical and other assistance on the part of Americans, should

Laying a stretch of new asphalt road in Soviet Russia. Federal and local authorities have appropriated $1,000,000 for road work during the coming year

Threshold of Important tive Developments

result in the purchase of considerable additional materials, machinery and equipment from American firms. Remarkable opportunities would be opened for American manufacturers and for American engineers to apply their experience in Russia in the various branches of the automobile industry.

Russia is growing so fast that the possibilities for the employment of American capital and technique are tremendous. Such contact would, of course, prove of inestimable value to Russia as well as to the United States. The prospects of development in the related industries (metallurgical, machine tools, glass, conveyor and transmission equipment, etc.), are indeed great and should compel the interest of far-seeing firms in this country.

View of the assembly department of the Amo (Soviet-operated) automobile factory at Moscow

Our own automobile industry, in spite of the rapid development which we contemplate, will not be sufficient to cope with the market requirements. "Appetite grows upon what it feeds." So we may readily predict that for years to come, in addition to the motor cars manufactured by us, the balance of our requirements of cars and parts will have to be made up by imports from abroad. Naturally, those firms who participate and cooperate in the development of the motor car industry in the Soviet Union will get the lion's share of our automobile import trade.

$100,000,000 for Roads

In conclusion, I may add that the growth of the automobile industry in Russia will result in greater attention to the improvement of roads. The Federal and local authorities and the industries have apportioned about $100,000,000 for the coming year on the road improvement and building program, this being the first time in the history of our country that such a large sum will be expended for this purpose. In addition to the measures undertaken by the Government, the population of the various localities is being awakened by means of educational campaigns conducted by the popular society, Avtodor (Autos and Good Roads) and by government authorities to the realization of the necessity for improving their roads, and these campaigns are meeting with complete success.

I have no doubt that within a period of 20 years the whole country, having applied itself so seriously and energetically to the task of automobile development and road improvement, will have its ways and means of communication widely developed and motorized along modern lines.

New Selden Truck Models

SELDEN TRUCK CORP. will exhibit at the Road Builders' Show, Cleveland, Jan. 14-18, two new valve-in-head six-cylinder roadbuilder trucks, Models 47X and 37X, 2 and 4 tons, respectively. The engine of the heavier model has a 4 by 4⅛ in. engine developing 85 hp. at 2400 r.p.m., while the 2-ton model employs a 3⅜ by 4⅝ in. engine developing 70 hp. at 2400 r.p.m. Magneto and battery ignition, air cleaner and oil filter are standard on Model 47X. Battery ignition with distributor is used on the 2-tonner. Vacuum feed is employed by both.

In the 4-ton model power is transmitted through a dual-range, seven-speed transmission, mounted amidships, to a full-floating, double-reduction rear axle, providing a reduction of 7.85 to 1. A unit-mounted four-speed transmission connecting with a semi-floating, bevel gear rear, providing a reduction of 3⅜ to 1, is used in the 2-ton model. Tubular radius rods with ball and socket ends are used on both models.

Both service and hand brakes of Model 47X are internal and act on 17 by 5 in. drums. The service brakes act through B.K. vacuum booster equipment. Service brakes on the lighter model are Lockheed four-wheel hydraulic and act on 16 by 2¼ in. drums. The hand brake acts on the driveshaft.

Four semi-elliptic springs are used for both models with auxiliary or helper springs over the main springs. Pressed steel frames of ¼ in. stock are used on both models, but of 7-in. and 5¾-in. depth respectively.

Model 47X wheelbase is 146 in., 8 in. longer than Model 37X.

Many Developments in *Machine Shop Practice* Promised for 1929

Greater use of nickel and semi-steel in iron castings and wider adoption of integral-motor drive listed among trends which are expected to progress this year.

THE Machine Shop Practice Division of the American Society of Mechanical Engineers, in reporting progress of the divisional activities during the past year at the recent annual meeting of the society, listed some 30 developments that have either taken place or whose use has been extended during the period covered, and offered nearly 30 more items in which particular progress is looked for during the coming year.

This report, compiled from the combined experiences of a large number of executives of machining industries, probably is rather reliable in its forecasts of future activities since, in many cases, the forecasts have been made, undoubtedly, upon the basis of development work already under way in the several shops. For this reason it should be of major interest to automotive production men in giving them a general idea of what further improvements in machining methods and equipment may be offered for their use during 1929.

Developments for Coming Year

New or extended developments along the following lines is promised for the coming year:

1. Greater use of nickel and semi-steel in iron castings.
2. Improvement of die-casting material and greater use of die castings.
3. Replacement of scraping by grinding as the predominant operation in finishing sliding surfaces.
4. Development of cutting tools of greater capacity.
5. Standards for the noses of lathe spindles.
6. Wider adoption of integral-motor drives.
7. Application of small conveyor and material-handling installations.
8. Still further general applications of grinding.
9. Use of higher grade materials.
10. Development of better lubrication methods.
11. More attention given to rust-proofing.
12. Further application of anti-friction bearings.
13. More hydraulic applications.
14. Extended application of flanged motors.
15. The use of larger chip pans on production machines.
16. Production layouts made around material-handling systems.
17. Solution of the problem of a standard taper for machine spindles and the shanks of small tools.
18. More definite recognition of the economic fallacy accompanying the use of obsolete equipment.
19. Wider use of welding.
20. More extensive replacement of castings and forgings by welded steel.
21. Substitution of automatic machinery for hand labor.
22. Reduction of stock on castings allowed for machining.
23. Extension of piece-work payment systems.
24. More efficient training of apprentices.
25. Changes in machine tool design to be made necessary by anticipated changes in automotive manufacturing methods.
26. Adoption of uniform accounting systems by groups within the metal-working industries.
27. Greater recognition of the value of research.

Some of the more important developments during the past 18 months to which particular attention was called by the division's report included:

1. Increasing use of welding, including multiple spot welding.
2. Further application of hydraulic feeds and drives.
3. Greater use of alloy steel gears and shafts.
4. Extended application of anti-friction bearings.
5. Increasing use of automatic lubrication.
6. Developments in honing equipment.
7. Developments in forging methods and equipment.
8. Increased use of diamond boring.
9. Improvements in balancing equipment.
10. Wider adoption of multiple V-belt and multiple chain drives.
11. Increasing use of coining operations.
12. Wider applications of grinding.

Among the outstanding specific developments, most of which have been described in *Automotive Industries* during the past year, were mentioned brazing in hydrogen atmosphere, automatic plating equipment, gear shaving machine, milling machine with hydraulic table feed, magnetically-controlled carbon-arc welding, cutting alloys of unusual capacity, developments in the nitriding of steel, an automatic die-casting machine, an automatic internal grinder and a hydraulic crankpin grinder.

THE Diesel-powered truck of German make which was shipped to England some time last summer and submitted to an official trial under R. A. C. auspices was later experimented with by the engineering department of the London General Omnibus Co. It is believed the bus company will equip a certain number of its buses with Diesel engines, and if no unexpected troubles arise some portion of the fleet may be converted. The engineers of the bus company found that the engine could be slowed down readily to 400 r.p.m. and that it was satisfactory also in every other respect.

Just Among Ourselves

Routine is Toughest for Young Executives

A MAN with considerable experience training junior executives told us the other day that one of his chief troubles in developing mentally active young men into positions of responsibility has been the difficulty of getting them vitally interested in doing thoroughly the months and years of routine really necessary to their eventual assumption of executive jobs. The very type of mind, in other words, which in the end provides executive initiative and bears responsibilities well, frequently is of that active type which chafes under the long grind of routine necessary to the acquisition of proper technique. Even with near-geniuses, however, that technique is essential to maximum final values. Men have become presidents even of organizations without understanding thoroughly the processes and methods of the various departments of their businesses; but they rarely have turned out to be the best presidents that it was possible to get.

* * *

Mastery of Technique Necessary for Success

MASTERY of technique is necessary to the best performance, it seems to us, in every form of endeavor, whether it be music or art or automotive management. Technique may hamper some by operating as bonds of tradition, but it forms the basis for the soundest and most permanently successful new departures when imbibed by vigorous, active minds. We see eye to eye with Ernest Newman, the British musical critic, who says so aptly in his book of familar essays, "A Musical Motley," that "Technique makes a clear road along which the impulses of the brain can realize themselves without let or hindrance." The man who doesn't have powers of concentration enough to permit acquisition of proper technique is likely to find himself, however brilliant, forever fumbling and mumbling his best conceptions even if he has forced his way to positions requiring responsibility and independent action.

* * *

Henry Ford on Thrift

HENRY FORD now tells us that no successful boy ever saved money. If only the converse could be proved true what a wonderful lot of successes we all would be.

* * *

Recent Mergers Based on Constructive Motives

DESPITE the fine and constructive contribution which the bankers of this country have made to the upbuilding and development of the automotive industry, there is no doubt that some mergers of companies in the past have been and that some in the future will be dictated as much by possibilities of profit seen by some banking house in the processes of making the combination itself as by the definite ultimate benefits from a permanent operating standpoint likely to be derived. This being the case, it is particularly pleasing to note that the three important consolidations among passenger car companies which took place during 1928 all are dominated in their new managements by men and forces who, on their clear past record, are interested primarily in building and maintaining manufacturing organizations as a means to consistent, constant profits and in no sense in attempting to gather that profit through financial operations *per se*. For that reason among others it is fair to say that the 1928 mergers have been such as to contribute definitely to the greater permanent stability of the automotive industry.

* * *

Overcapacity Doesn't Clash With Prosperity

BECAUSE of apparently widespread misapprehensions outside our industry, we are constrained to repeat what we have already written in the first article of this issue about automotive overcapacity for production and automotive prosperity. For a number of years now our industry has been capable of building many more vehicles than it could find buyers for. But it has continued to operate at partial capacity and pay good profits to its stockholders and investors as well as good salaries or profits to those actually engaged in its operations. The same condition exists as we start 1929—and the same favorable results are to be expected.

* * *

We're Sure It'll be— "A Happy New Year"

WE don't know of any new way to say "Happy New Year." But we do say it to every friend and reader of *Automotive Industries* with new vigor, new enthusiasm and old sincerity as we begin that year of wonderful promise, 1929. *Happy New Year!*—N.G.S.

New *Steam*-Propelled Motor *Bus* Has Horizontal Boiler

Crosswise mounting of engine and combined fuel and water pump also features of Delling Coach. Powerplant has three cylinders and is of the double-acting type.

By P. M. Heldt

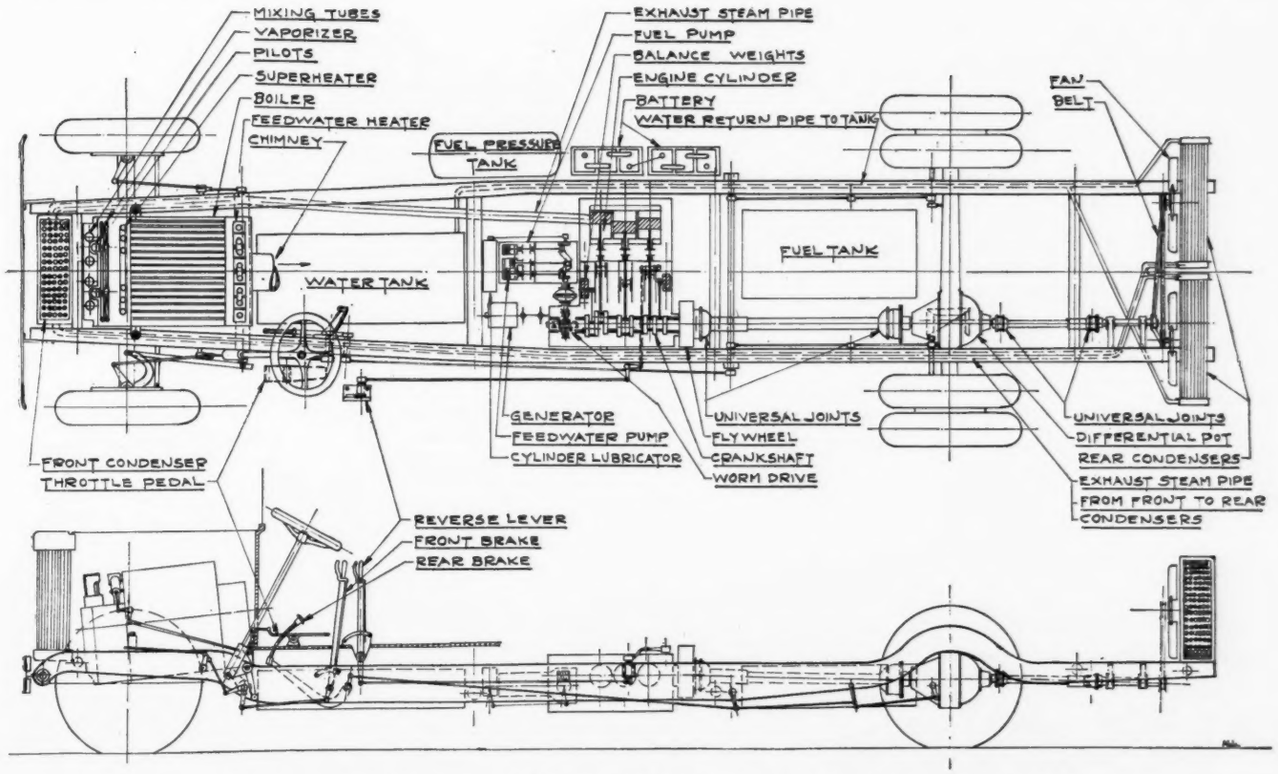
Delling steam coach

DELLING MOTORS CO., Camden, N. J., has developed a steam coach with seating capacity for 27 in interurban and several more in urban service. The sponsors of this coach are strong in their belief in steam propulsion for buses, especially for use in cities where frequent stops have to be made and a high rate of acceleration is important; and in mountainous territory, where the demand for power varies within wide limits. They make the following claims for their coach, as compared with the conventional internal-combustion-engine type:

1. It uses a cheaper fuel, viz., furnace oil of from 36 to 40 deg. Baume, which can be bought in tank carloads at from 5 to 6 cents per gal., while the mileage per gal. equals that of a gas-electric bus.
2. There is less engine wear and tear, as the engine makes only about one-third the number of revolutions per mile.
3. The maximum acceleration is much greater. The fully loaded bus can be accelerated from a standstill to 20 m.p.h. in 8 seconds, in consequence of which it can make a much better schedule on routes on which many stops have to be made.
4. Longer engine life is obtained because engine lubricating conditions are better, there being no dilution of the lubricating oil and no road dust drawn into the engine with the working fluid. Boiler life is expected to be equal to that of the bus.
5. The bus has better hill-climbing ability and is generally more flexible, which latter quality is of particular importance in congested traffic.
6. In ease of operation and riding comfort it is equal to the gas-electric.
7. Steam heating can be used for the bus in cold weather, which is free from the objection to exhaust gas-heating, that passengers are annoyed by gases leaking into the bus from the heater or its connections.

The powerplant comprises a horizontal fire-tube boiler located under a hood at the front of the coach, with its axis in the fore-and-aft direction. This boiler has a shell of ⅜-in. hammer-welded steel, with an inside diameter of 34 in. and a length of 26 in., and two headers, which are also ⅜ in. thick. The shell is wound with five layers of piano wire to provide the necessary radial strength. Six hundred and eighty-six copper fire tubes of ⅝ in. outside diameter extend through the boiler and are expanded into the headers. There are no tubes through the upper part of the boiler, which is normally filled with steam, hence the fire tubes are at all times submerged in water. There are reinforcements on the headers over the steam space, and a number of stay bolts pass through this part of the boiler. The headers are flanged and welded to the shell, and two reinforcing rings are then shrunk over the ends of the shell and welded to both the shell and the header. To the reinforcing ring at the forward end are welded two supporting brackets by which the boiler is supported on the chassis frame, while the rear end is supported by a cradle on a frame cross-member in such a manner that it is free to expand longitudinally; it is held against bouncing on the frame by hold-down bolts.

The outside of the boiler is covered by an insulating lagging of millboard about ¾ in. thick, and this in turn has a protective covering of sheet aluminum. Steam is



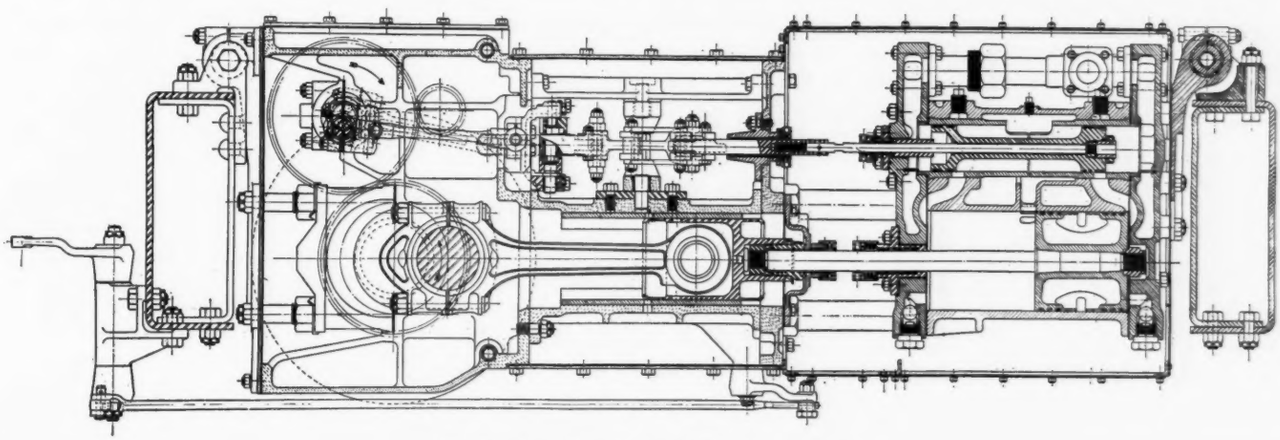
Plan and elevation views of the new Delling steam bus, showing layout of units

carried at pressures of between 600 and 700 lb. p. sq. in.

Steam is taken from the boiler through a dry pipe which extends longitudinally through the steam space and has a number of small holes drilled through its wall, so that no water can be carried along. It passes directly to the throttle valve, which is of a combination sleeve and poppet valve type. The sleeve portion has a port in it which can be made to register with a port in the valve housing, this part of the valve serving for the regulation of the steam flow. After passing through these ports the steam passes through the throat of the poppet valve, the chief object of which is to prevent leakage when the valve is closed.

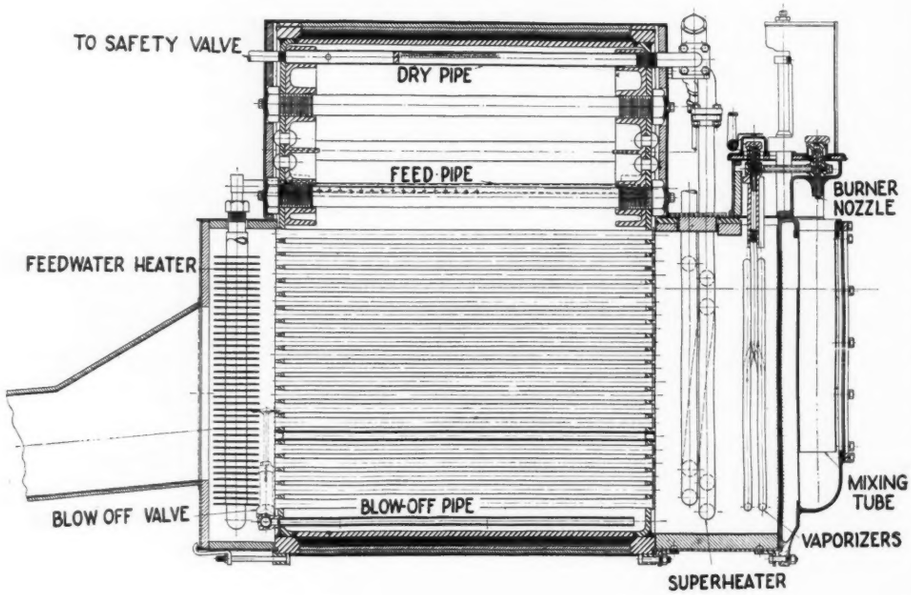
The burner is located at the forward end of the boiler and may be described as of the Bunsen type. The air required is drawn into the burner through four venturis by the vaporized fuel which is injected into them from the nozzles. A pilot is kept burning constantly, and this keeps a portion of the main-burner vaporizer tube at a high temperature at all times.

The pilot light burns the same kind of fuel, viz.: furnace oil, as the main burner. In starting the pilot light, use is made of current from the storage battery carried on the bus. The pilot light also is of the Bunsen type. When the operator desires to start the pilot, he presses on a push switch located at the front of the bus. This closes an electric circuit and sends current from the storage battery through a length of nichrome tubing forming a part of the vaporizer for the pilot light. When this tube becomes red hot the driver turns on the fuel for the pilot light by means of a conveniently located hand valve. The pilot light is lighted by a length of nichrome wire which is brought up to red heat by being connected in series with the nichrome vaporizer tube. Immediately after the pilot has been lighted the driver releases the push switch and the electric circuit opens automatically (the same as the starter switch on a gasoline vehicle).



Vertical section through steam engine

The pilot light, as already pointed out, heats a portion of the vaporizer for the main burner. This consists of a coil of heat-resisting pipe located in the combustion chamber. There are actually two such vaporizers, each feeding two venturis, and there are two pilot burners, each keeping a portion of one of the main-burner vaporizers at the proper temperature. After the operator has turned the fuel onto the pilot light, he waits for a predetermined time and then turns fuel onto the main burner, which is ignited by the pilot light. In service the pilot lights are kept going all the time, and keep the main-burner vaporizer heated sufficiently so that the main burner can be turned on whenever desired. Ordinarily each burner heats its own vaporizer.



Longitudinal section through horizontal boiler and combustion chamber

The products of combustion collect in a hood at the rear of the boiler and then pass through a flue around the driver's seat and up at the driver's left side to the roof of the bus, where they are discharged.

Fuel is carried in a 50-gal. tank which is located on the frame between the engine and the rear axle. It is supplied to the burners by a pump which is combined with the feed-water pump and will be described in connection with the latter. This pump delivers into a pressure reservoir, which is similar to an "expansion chamber" on a steam pump. Normally it is about half-filled with fuel, containing about 7 gal., while above the fuel there is an air pocket containing air under 160 lb. p. sq. in. pressure. The chief object of this air chamber is to supply fuel to the burner when the bus is standing; that is, when the pump is not operating. After leaving the pressure chamber the fuel first passes through a filter and it then comes to a fork in the line. One branch from this fork carries the fuel through a reducing valve (which reduces the pressure to 40 lb. p. sq. in.) to the pilot burner, while the other branch takes it first through the low-water shut-off valve, then through the boiler-pressure regulator, and finally through a hand shut-off valve, to the vaporizer of the main burner.

The low-water shut-off valve is thermostatically operated. It comprises a brass tube which connects to the boiler near the bottom and at a level which is considered to be the lowest to which the water can be allowed to drop with safety. As soon as the water level drops to this point, steam will enter the brass tube and expand it, and the effect of this is to shut a valve in the line of the main burner. This device serves only as a safeguard in case the driver should try to run the bus without water in the tank.

Boiler pressure is regulated by means of a diaphragm valve, which shuts off the fuel flow to the main burner when the boiler pressure exceeds a certain value and opens the fuel flow when the steam pressure has dropped a certain amount.

In the earlier steam vehicles the boiler and burner were the most delicate parts. The designers of the Delling steam coach claim that boiler weakness was due chiefly to the fact that vertical installations were used. All sediment collected at the bottom and settled between the closely spaced tubes, from where it was practically impossible to dislodge it by the usual process of blowing off. In the horizontal boiler used in the Delling coach, the sediment will collect on the lowermost part of the cylindrical shell, which is about an inch below the lowest tube. Here a blow-off pipe, with a number of openings, extends through the whole length of the boiler and is connected to a blow-off cock at the rear end. By blowing off at regular intervals, the boiler can be kept practically free from sediment. Moreover, the surface covered by any sediment which may form is not exposed to the heat of the flame. There has been also some trouble in the past from particles of scale getting into control devices through the connection from these devices to the bottom of the boiler, and all such trouble is claimed to be eliminated in the new design, in which, aside from the fact that the layer of scale never reaches any considerable thickness, the connections are made at some distance from the bottom.

Engine Details

The engine is a three-cylinder horizontal one, with a bore of 4¼ in. and a stroke of 4¾ in. It is a double-acting engine and works on the uniflow principle; that is, the piston when approaching the end of its stroke, uncovers a port in the cylinder wall through which most of the steam escapes. The remainder of the spent steam escapes through a piston valve at the end of the cylinder, which also controls steam admission. This valve is operated by means of a modified Walschaert valve gear. The point of cut-off is varied automatically by means of a device controlled, through the intermediary of an oil-pressure mechanism, by the speed of the engine. The engine being direct-geared to the vehicle, its speed is at all times proportional to the vehicle speed. Up to 8 m.p.h. the full cut-off is used; from this speed up to 20 m.p.h. the cut-off varies, while at above 20 m.p.h. the cut-off is a minimum.

The engine is arranged on the chassis frame with its crankshaft axis extending fore and aft, but located quite a distance to the left of the chassis axis. Thus the cylinder block is located on the right side of the chassis and the crankcase on the left side. The engine

can be reached through a trap door in the floor and also, of course, from underneath. The drive is through a propeller shaft with Spicer metal universal joints to the rear axle, in which the differential housing is located to the left of the center.

Since the engine is double-acting, each stroke of each piston is a power stroke, and the uniformity of torque is about the same as obtained with a 12-cylinder four-cycle internal combustion engine. Continuity of torque is therefore inherent in the design, but the torque naturally fluctuates, and to prevent this from becoming unpleasant at low speed, the engine is provided with a 12½-in. flywheel.

Reciprocating Balance Weights

The three cranks of the engine are set at 120 deg. There are no unbalanced free forces in such an engine, but a couple is produced by the inertia forces of the reciprocating parts. This couple is balanced by a pair of reciprocating balance weights driven from two crankpins set at 180 deg. and located next to the outer main bearings. There is a main bearing at each side of each crank throw, and the engine therefore has four main bearings.

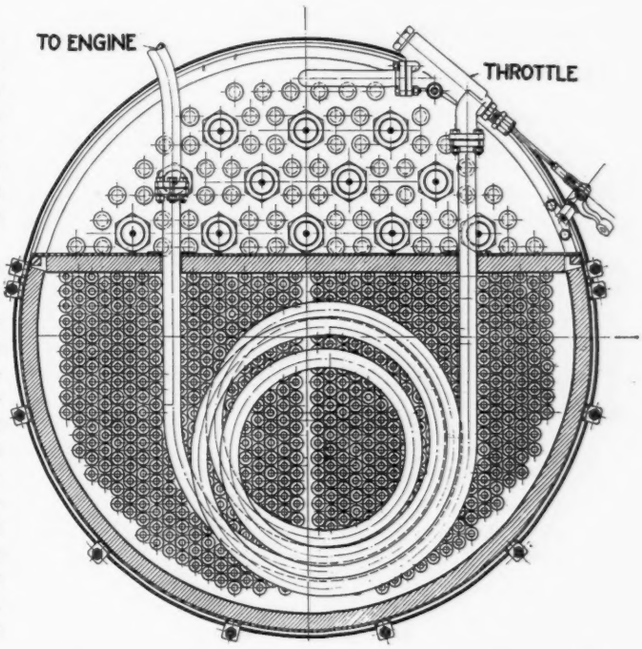
While the boiler is constantly maintained under a pressure of between 600 and 700 lb. p. sq. in., the pressure of the steam as it enters the cylinder is only about 150 lb. p. sq. in. on the average. The reason for this is that the power required under normal operating conditions is much less than the engine is capable of developing under full boiler pressure, and the pressure is therefore reduced by the throttle valve (the same as the compression is reduced by the throttle in a gasoline-engined vehicle under normal conditions). This throttling has the effect of drying and superheating the steam, which after leaving the throttle passes through a superheating coil of heat-resisting steel located in the combustion chamber, where it is further superheated. The normal temperature of the steam as it enters the engine is 550 deg. Fahr.

From the engine various accessories are driven through a cross shaft, which in turn is driven from the forward end of the crankshaft through worm gearing. These units include a triple piston pump for the fuel and feed water and the cylinder lubricator, which is of the ratchet-operated type and of Madison-Kipp make. An electric generator, the capacity of which may be varied in accordance with the current demand for lighting and other purposes, is driven through a pair of gears with case-hardened and ground teeth from the engine eccentric shaft.

Water and Fuel Pumps

Of the three cylinders of the pump, one serves for the fuel feed and the other two for the boiler feed. Boiler feed is thermostatically controlled. The control valve comprises a brass tube which communicates with the boiler near the bottom and at the level at which it is desired to keep the water. When the water level drops below this point, steam enters the brass tube and expands it, thereby closing the valve which allows the water to be by-passed back to the tank. Each cylinder of the two supplying the boiler is controlled by a separate thermostatic valve. The upper connections of the thermostats to the boiler are not at the same level, one being 1 in. lower than the other. Thus when there is plenty of water in the boiler the delivery from both pump cylinders will be returned to the water tank. As the level drops to the upper connection of one of the thermostats, the pump cylinder controlled by that thermostat begins feeding the boiler, and if, owing to heavy steam consumption, the water level drops 1 in. more, then the other pump cylinder will also begin to feed the boiler. Before entering the boiler the water is filtered twice.

Exhaust steam from the engine is led into a two-section condenser at the front of the bus. It enters one section at the bottom, passes to the top of it, then over to the other section, and leaves the latter at the bottom. From this condenser the steam passes on to two condensers at the rear of the bus, each of which is provided with a fan. For driving these fans a short shaft is arranged in the rear of the differential housing, coaxial with the driving bevel pinion and driven from the bevel ring gear. This shaft carries a double pulley from which the two fans are driven by belts.



Cross-section through combustion chamber showing superheater coil, with boiler header plate in background

From these rear condensers there is a return to the water tank, at the inlet to which there is a sort of separator. Normally, practically all of the exhaust steam is condensed and only water enters the tank from the rear condenser. However, the relation of the condensing capacity to the rate of steam discharge by the engine depends upon conditions of operation and atmospheric conditions.

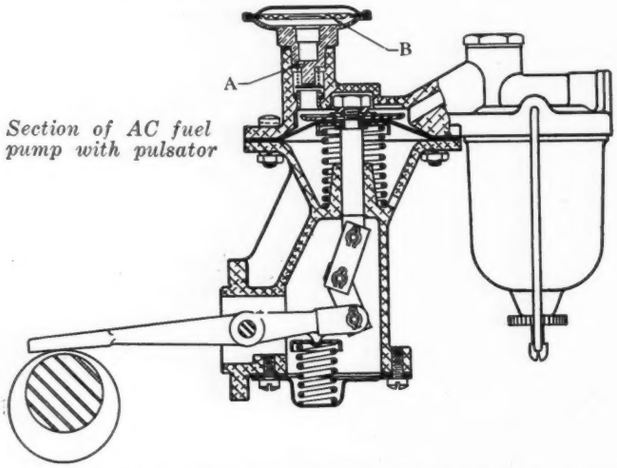
Control devices on the Delling steam coach are arranged substantially the same as on a gas-electric bus, and a driver accustomed to the latter evidently could step right into one of these steam buses and operate it. Steering is by handwheel as in all other motor vehicles. The throttle is controlled by a pedal under the left foot. The right foot of the driver is on a pedal controlling the brake which acts on the rear wheels. Brakes are fitted also on the front wheels, and these are applied by a forward motion of a long lever operated by the driver's right hand. There is another lever on the left side of the driver which reverses the direction of motion.

In a demonstration run in the neighborhood of Philadelphia the bus proved to be very smooth-running and comfortable, and to have abundant power on hills. The weight is 18,100 lb. inclusive of a 6500-lb. body.

NEW DEVELOPMENTS—Automotive

AC Fuel Pump Pulsator

ON some of the later 1928 and other 1929 automobile models the AC fuel pump is fitted with a pulsator, which is a small diaphragm chamber assembled to the pump in place of the plug over the outlet valve. The



Section of AC fuel pump with pulsator

object of this device is to insure sufficient fuel at top speeds on installations where there is piping between the pump and carburetor, or a restricted inlet to the latter.

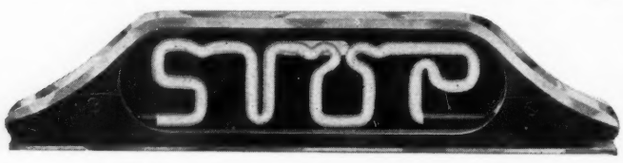
The pulsator functions as follows: On the pressure stroke of the pump fuel is forced into the pulsator chamber, the flexible diaphragm of which expands upward. On the intake stroke of the pump, with the outlet valve closed, this diaphragm springs back to normal position, forcing the additional fuel downward and to the carburetor. The use of this device increases the pump delivery approximately 30 per cent within the high speed range.

Glass Tube Stoplight

THE gas-filled glass tube sign that has become so popular recently has been made into a stoplight by Stewart-Warner. The peculiar, penetrating, non-glaring infra-red ray of this tube penetrates snow, rain, fog, dust and exhaust and is without unpleasant glare.

The new stoplight is about 6 in. wide by 2 in. high by 1 in. thick. It is all nickeled except on the face, which is dull black enameled, as a background on which the tough Pyrex glass tube is placed. Stout clips hold the tube in place. The tube itself is bent to form the letters of the word "stop."

Another interesting thing about the light is that it is placed at the eye level of oncoming drivers, in the rear window of the car. A clip fastens it to the sill and its wires follow the fold of the upholstery to a coil similar to an ignition coil, necessary for the high tension that is required, which is located under the rear seat or at any convenient point.



Stewart-Warner glass tube stoplight

O-Z Hand Tachometer

O. ZERNICKOW CO., 15 Park Row, New York, has recently brought out an improved line of O-Z hand tachometers with which it is possible to read directly, without calculating, revolutions per minute, right or left, of revolving objects; surface or peripheral speeds in feet per minute, right or left; speed variations during a fraction of a revolution, and belt slippage.

The new instruments have hardened and ground steel spindles which run in ball and bronze bearings. The gear shift is of the rotating type and is dust-proof and provides a wide travel from one range to the next, preventing the engagement of the wrong range by mistake. They are made for speeds from 20 up to 40,000 r.p.m.

Jig Borer Indexing Tables

TWO new types of indexing tables have been developed by Pratt & Whitney Co., for use on its jig borer. One is a tilting rotary table while the second is a rotary indexing table much larger than has been available heretofore.

The tilting rotary table is secured to the regular table by clamps and provides an accurate rotary table to which has been added the tilting feature. The table has a scraped surface 12 in. in diameter and is provided with T-slots for clamping work. The outer edge of

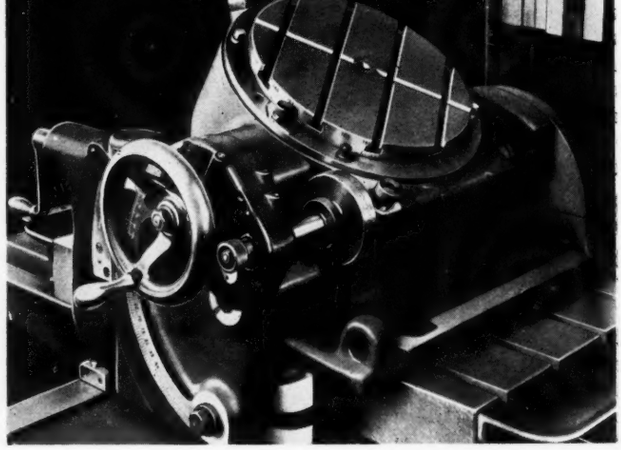


Fig. 1—Tilting rotary table for Pratt & Whitney jig borers

the table is graduated in degrees for approximate indexing, while a slow-motion hand-wheel permits indexing accurately to 5 sec. Suitable binders lock the table in position for boring.

The tilting feature of the table is taken care of by hinging it at one side and raising or lowering it by

Parts, Accessories and Production Tools

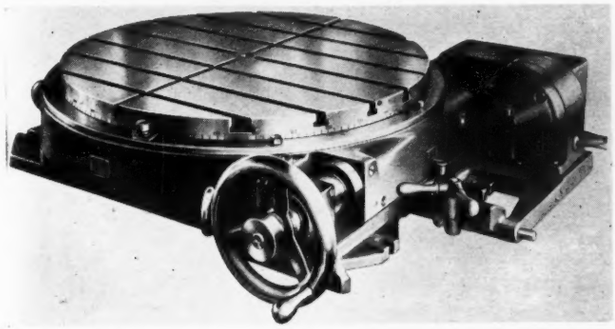


Fig. 2—Motor-driven, 30-in. diameter, rotary table for Pratt & Whitney jig borers

means of a crank which drives through a worm meshing with a gear segment. Settings to 5 sec. of arc are possible.

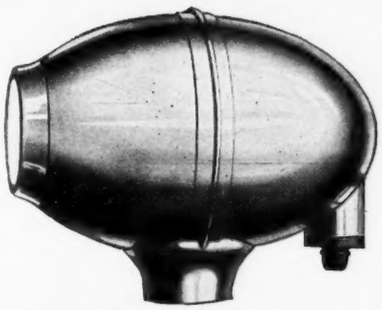
The second table has a highly accurate working surface 30 in. in diameter and is also provided with numerous T-slots for clamping work. The added feature of this new table is a small motor drive controlled by a convenient lever by means of which the table can be moved rapidly under power. Otherwise it is similar to the standard rotary table supplied with the machines.

Cowdrey Brake Tester

TWO smaller models of brake testing machines to be known as the Nos. 1 and 9 Junior have been developed by the Cowdrey Brake Tester Organization, Fitchburg, Mass. These new machines have been developed for the use of dealer organizations in particular which have small cars to be tested. These new models are designed to do a complete testing job. They detect eccentric drums, greasy or glazed lining, and enable the operator to predict stopping distance. With the No. 1 Junior model but one axle can be tested at a time, but if desired additional parts can be purchased which will make it into a No. 9 Junior machine which adjusts both axles at once.

Whalen Headlamp

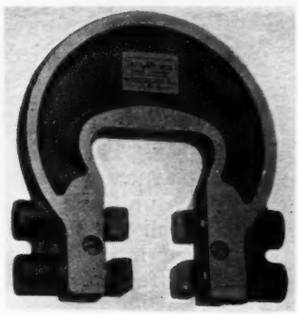
A NEW headlamp with a 98 per cent efficiency rating and which employs a new principle of reflection and redirection of light has been placed on the market by the Redirected Light Corp., Syracuse, N. Y. Known as the Whalen light, it is said to throw a glareless beam 500 ft. ahead, at the same time clearly illuminating both sides of the road.



Whalen headlamp

The lamp consists of an ellipsoidal reflector with a glass front. The lamp filament is placed at the rear focal point of the ellipsoid and all light beams emerging from this common focus are reflected through one or the other of the two forward foci. This provides a wide-spread beam through the shorter focus and an intense beam, carrying great distances, through the longer.

External Thread Gage



Taft-Pierce tool for measuring external thread gages

A NEW tool for measuring external thread gages has been developed by the Taft-Pierce Manufacturing Co., Woonsocket, R. I., which resembles a usual snap gage but is provided with four hardened tool-steel adjustable anvils paired for accurate "Go" and "Not Go" gaging. Gaging members are true thread forms, adjustments are easy and may be set by means of reference thread plug gages or by wires and measuring blocks. The new gage is available in eight sizes from ¼ to 4 in., and threaded anvils can be furnished for any pitch and percentage of thread engagement desired.

Bryant Chucking Grinder

A MOTORIZED, multiple-purpose machine for grinding bores, faces and outside diameters at a single chucking has been introduced by Bryant Chucking Grinder Co., Springfield, Vt. This new machine is similar to the No. 12 grinder brought out a year ago, having the same general dimensions with a maximum swing of 16 in. and a maximum stroke of 11 in.

It is of the single-slide type with both traverse and

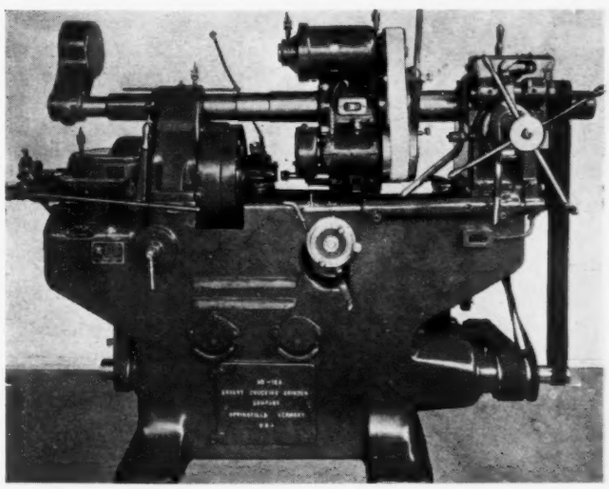


Fig. 1—New Bryant 12-A hole and face grinder

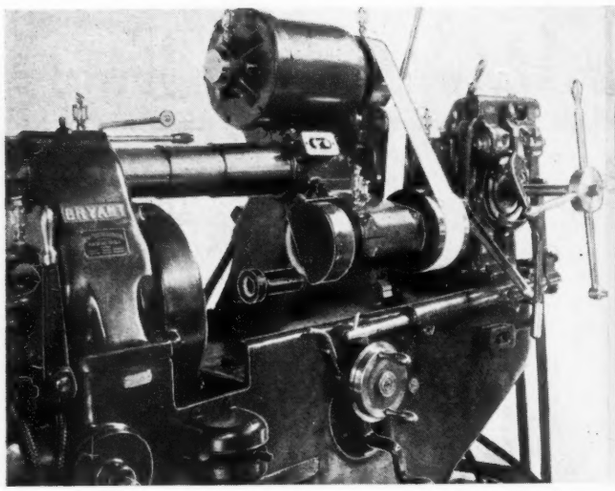


Fig. 2—Wheel slide in position for hole grinding

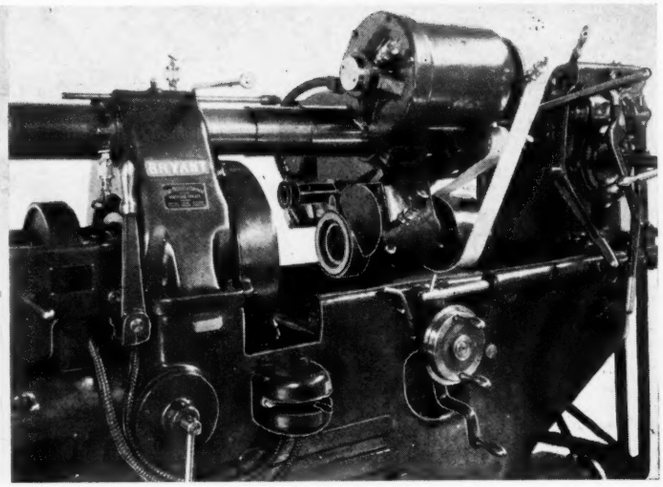
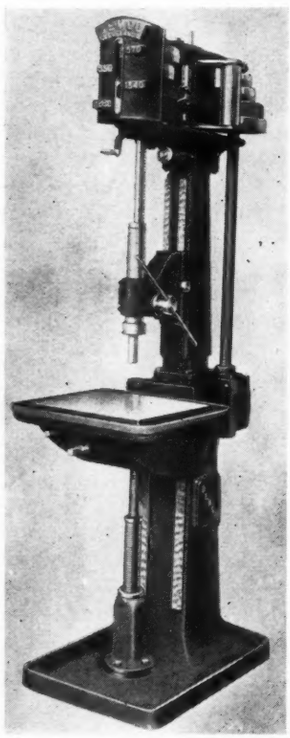


Fig. 3—Slide back on latch ready for a facing operation

cross-feed from the same overhead bearings. The wheel slide has a bracket mounted on its front which contains a facing wheelhead. This wheelhead is a unit and can be removed by taking off the spindle pulley. Longitudinal adjustment is provided to prevent interference with the hole grinding wheel while the facing wheel is in use.

Both wheels are driven by a single 7½ hp. motor running at 3600 r.p.m. through a canvas belt. The wheel slide is counterbalanced to make it easy to change the position of the wheels. An outside diameter stop is provided and operated by a lever beneath the cross-feed handwheel which throws a floating stop over the feed screw roll, thus changing the position of the wheel without disturbing the cross-feed screw position.

Demco Drilling Machine



Demco drill

A LINE of sensitive drilling machines has been developed by the Merit Equipment Corp., Cleveland, Ohio, in which the spindle is said to be automatically compensated for wear, it having no lost motion and requiring no adjustment. Some of the other mechanical advantages of this new machine are: All revolving parts balanced and equipped with ball bearings; flat endless belt from spindle to driveshaft cone; automatic belt tension idler; counterbalanced sliding head; enclosed back shaft and removable gearbox.

Model K machines of ⅞ in. capacity, are furnished with belt or motor drive with from one to six spindles and with either hand or automatic power feed. By use of the Demco patented feed the dial can be set to the desired depth to be drilled, locked by means of a knurled binder screw, and the feed will automatically disengage at this point and the spindles be returned to starting position. Feed can be set to continue to operate automatically, or stop on the return stroke to be advanced by hand.

The operator has full control of the spindle at all times and can either raise or lower the spindle while the power feed is in action. Four feeds are available ranging from 0.003 to 0.013 in. to a drilling depth of 5 in.

AT a joint meeting of the British Institution of Automobile Engineers and the Royal Aeronautical Society held in London recently some details concerning the Beardmore compression-ignition (Diesel type) engines built for one of the two British State airships of 5,000,000 cu. ft. capacity now under construction were given by Wing-Commander Cave-Brown-Cave of the Air Ministry. He stated that these engines—straight-eights, with a bore and stroke of 8¼ by 12 in.—weighed 8 lb. per hp., having been reduced to that from a basic design that weighed 100 lb. per hp. There was, however, no fundamental reason, he said, why the weight should not be reduced a great deal further, to something under 4 lb. per hp. or less than twice the weight of the average gasoline engine of corresponding type and refinement.

Originally it was hoped that these engines would develop 700 hp. at 1000 r.p.m., but they were now developing continuous full power of 585 hp. with a maximum of 650 hp. using crude oil as fuel, the latter effecting 30 per cent economy as compared with the fuel of gasoline engines. The fuel consumption at continuous full power, it is stated, is .385 lb. per b.hp. hour, a rate that is improved slightly for a small decrease of power.

The greatest difficulty met with in the development of this engine, the Wing-Commander said, had been "torsional resonance" in the crankshaft. Evaporative cooling was used, a system having been evolved in which as the water in the cylinder jackets developed steam the latter passed to a radiator at atmospheric pressure, was condensed and passed back to the cylinder jackets. Any waste steam would be used for heating the ship.

An auxiliary gasoline engine—the only source of power derived from gasoline stored in tanks isolated from the airship itself—was used to start the main engine in each of the five power cars.

Adequate Ventilation Essential in *Chromium Plating* Plants

Danger to workers small if plating room is kept free of acid spray. Floors should be washed frequently and operators treated promptly for all skin or nose infections.

By K. W. Stillman

PROPERLY designed ventilating systems and daily physical precautions on the part of workmen appear capable of making very small the health hazards to those employed in chromium plating. This indication is drawn from study of a report of an investigation just made public by the Public Health Service and the Bureau of Standards on this subject.

Natural ventilation, the investigation revealed, is seldom, if ever, adequate to remove the chromic acid spray, but a properly designed system with sufficient air velocity can reduce the chromic acid content below the danger point. The absolute necessity of such a system is indicated by the statement in the report that continuous daily exposure to more than one milligram of chromic acid per 10 cubic meters of air is regarded as likely to cause injury to the nasal passages. The report indicated, also, that these adequate conditions do not exist in a number of the plants now doing chromium plating work.

The investigation covered six plants employing 27 workers as chromium platers, although more than 70 other workers were engaged in the process and were more or less exposed to the chromic acid spray, Twenty-three of these workers, four of whom were used as controls, were given physical examinations and their occupational history obtained. Earlier studies having indicated that the most common site of injury from chromic acid is the nasal septum and exposed places on the body where the skin is broken, particular attention was given to such locations by the examiners.

The approximate daily exposure to the acid mist of each person examined was found to vary from less than 1 milligram to 56 milligrams of chromic acid per 10 cubic meters of air and the time spent daily over the plating tanks varied from zero to seven hours.

Of the 19 persons employed in the plating rooms, three or 16 per cent had perforated septums, the holes varying from 1 to 4 centimeters in diameter. One of the three was not engaged as a plater but as a helper and was stationed about 10 ft. from the tanks.

Four workers had an ulcerated septum and the majority of workers had ulcerated mucosa. More than half the total number working in the plating rooms suffered from frequent nosebleed.

Of the 14 workers actually engaged in plating, six had chrome holes on their hands, the number of holes varying from one to five. The chrome holes were not caused by exposure to the acid mist but by contact of the broken skin with the acid solution.

There were only two platers who did not show any effects of the exposure. One of them had been employed a short time each day for only 20 days, while the other had taken the precaution to use vaseline in his nasal passages and to wash his hands frequently.

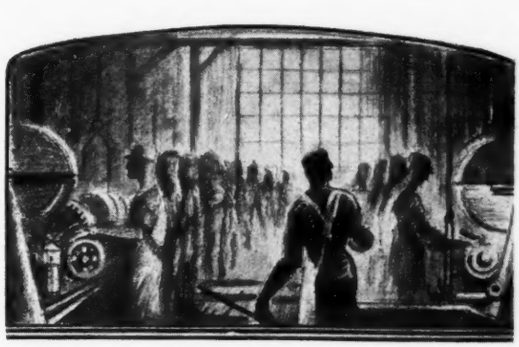
Even those workers not actually engaged in plating but at work not far from the tanks and exposed to only a small amount of the acid mist for only a week or two, already showed damage to the nasal passages from the chromic mist. The four controls who were not exposed to the acid mist or solution failed to show any nasal damage or ulceration of any of the exposed parts of the body.

Ventilating Systems Inadequate

Practically all the plating rooms used for the study had ventilating systems in which the acid mist was removed by drawing air laterally across the tanks but either the air velocity was not great enough or some other defect in the system operated against complete removal of the spray.

The conclusions drawn from this survey were that operators should guard against injury to the nasal passages by applying vaseline or mentholatum to these tissues daily. Rubber boots, gloves and aprons should be used whenever possible and if gloves are not used the hands should be washed frequently and all cuts or abrasions greased with a mixture of three parts vaseline to one part lanolin.

All floors near the plating tanks should be washed frequently and operators should be examined periodically with prompt treatment of the slightest skin or nose infections. The treatment should include washing with bisulphate, ammonium polysulphide or thiosulphate solution; application of an ointment, and a waterproof dressing.



Other suggestions made were that the level of the plating mixture be kept at least 8 in. below the top of the tank and that the ducts, which should not be required to draw the air a lateral distance of more than 18 in., should be from 1 to 2 in. wide.

Unusual Methods Found

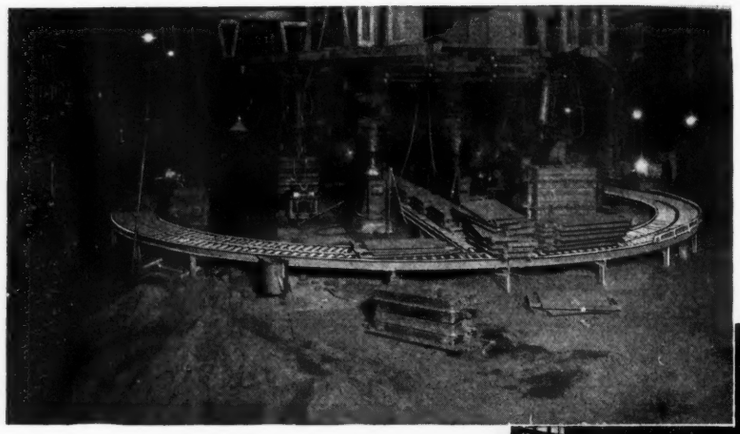


Fig. 1

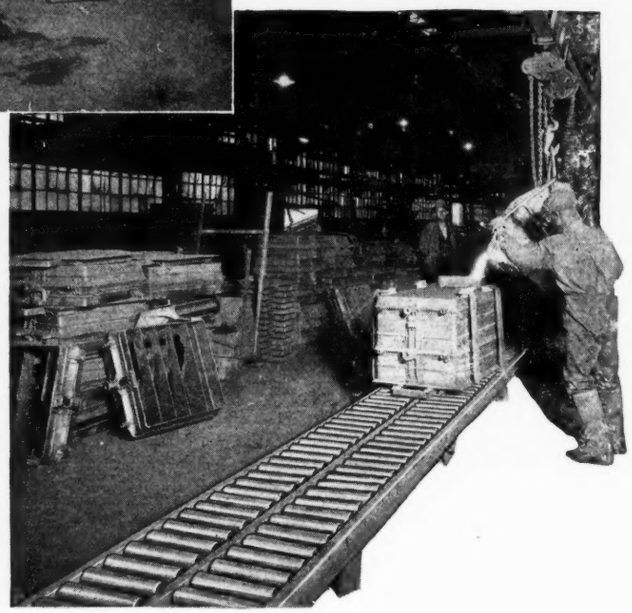


Fig. 2

Continuous pouring installation is used in Wilson foundry. Roller conveyors at Willys plant for radiator cores.

By K. W. Stillman

IN every automotive plant in the country there probably are at least a few material handling problems which have been solved in a somewhat novel manner which is applicable to similar problems, and even to quite dissimilar problems, to be found in other plants.

Continuing the line of thought presented by the article on material handling published in the Annual Production Issue of *Automotive Industries*—Nov. 17, 1928—we illustrate here two particularly interesting mechanical handling installations employed in the production of Willys-Knight automobiles. Figs. 1 and 2 show two views of the plant of the Wilson Foundry & Machine Co., where Willys-Knight engines are manufactured. In this plant material handling activities have been very definitely tied up with production operations.

Fig. 1 shows the curved end of a "horseshoe" conveyor, installed by the Logan Co., on which the cope and drag of cylinder blocks are assembled. The air hoists mounted on the overhead trolleys assist in the assembling work.

After assembly the copes and drags are pushed down either side of the conveyor to the point shown in Fig. 2 where the mold is poured. The ladles are transported by means of chain hoists and monorail systems and extend for some distance along the conveyor so that pouring can be done wherever it is most convenient.

After being poured the molds pass on down the conveyor until they arrive at the shake-out floor. Here the flasks are removed and are placed on another conveyor which returns them to the assembly point again ready to be used once more. The return flask conveyor is shown in the center of Fig. 1.

Moving now to the Willys-Overland plant itself, one finds that the assembly of radiator cores is being facilitated by another system of Logan gravity roller conveyors. As shown in Fig 3, trays full of

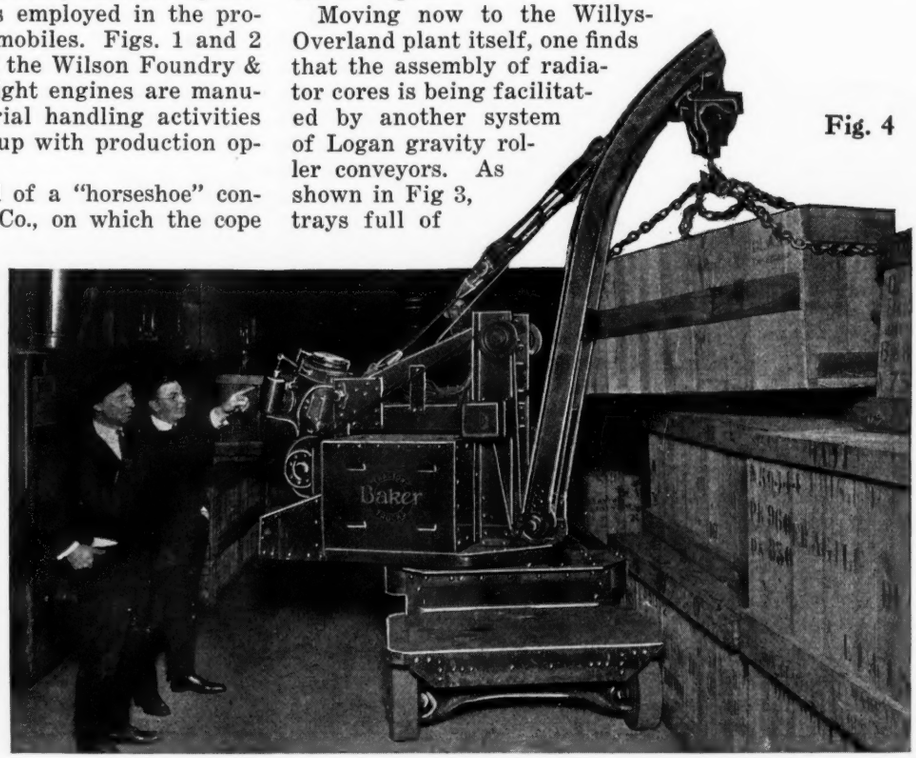


Fig. 4

Material-Handling Systems in Automotive Plants

parts come to the workmen on the lower line of the double-deck conveyor while empty trays are returned on the upper line. Floor space has been saved by the installation of this system, while an increase in production has also resulted.

Another interesting use of mechanical handling equipment for a job which becomes very difficult to handle otherwise is shown in Fig. 4. In one of the many Fisher body plants, this Baker-Raulang locomotive type crane is being employed to tier and remove these very heavy crates of plate glass.

Without mechanical equipment to do this job, either an immense amount of man-power would be required to handle these heavy crates in and out of storage or much more floor space would be required to store the crates without stacking them one on the other.

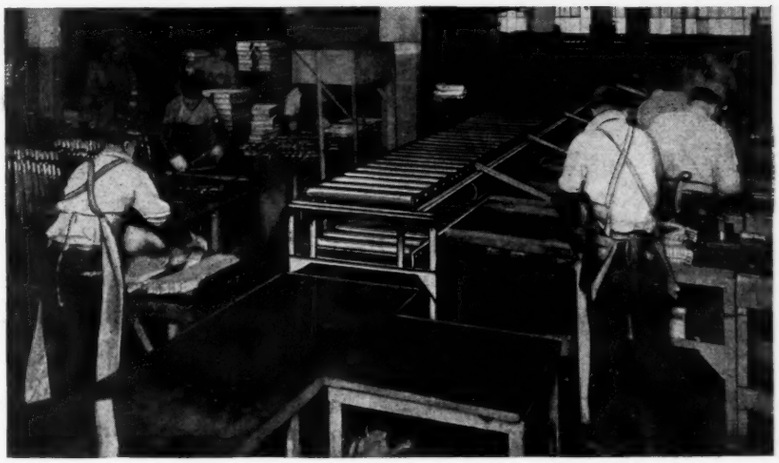


Fig. 3

5,000,000-Car Year

(Continued from page 929)

E. P. Hammond, president, Gemmer Mfg. Co.: The volume producers of motor cars are enlisting the services of the specialists of original equipment to a greater and greater degree. I look forward with confidence to 1929 bringing to the parts manufacturer who has the product and facilities to meet the new and finer requirements a larger share of business than ever before.

W. H. Schmidt, president, Unit Corp. of America: The expressions already given by leading producers of passenger cars and trucks bespeak for automotive parts and accessories companies a prosperous 1929.

W. G. Pancoast, chairman, Biflex Products Co.: Export sales of motor cars undoubtedly will increase in 1929. Domestic competition will be less strenuous and prices will not be pinched to such narrow margins. Production of motor vehicles, parts and accessories will be maintained at capacity. Labor will be steadily employed. Wages will be sustained and the buying capacity of the public maintained. A balancing of conditions in this manner will mean increased prosperity for the automotive and all dependent industries.

C. I. Ochs, Eaton Axle & Spring Co.: Our production for the fourth quarter of 1928 was exceptionally good and we look for the first quarter of 1929 to be equally good or better.

John H. Victor, Victor Mfg. & Gasket Co.: I believe that increased car registration as well as the prospect for large car production assures opportunities for good business for parts makers in 1929.

George W. Borg, president, Borg & Beck Co.: Parts and accessory manufacturers, from present indications, can look forward to a very satisfactory year for 1929, with reasonable expectations of exceeding 1928.

The Buda Co.: We are looking forward to at least a continuance of the business enjoyed in 1928 in the automotive end of our business. We feel moderately sure that this business will continue at least for the first six months of 1929, but are not so sure about the second six months.

Lawrence P. Fisher, president, Cadillac Motor Car Co.: It is my belief that motor vehicle production in 1929 will be within 5,000,000 units. The greatest gain will be made in the low-priced field because of the increase in two and three-car families and quickened replacement business resulting from sound general conditions and wide-spread prosperity.

Fageol Motors Co.: We believe that 1929 will be even a better truck year than 1928, but that leadership and maximum profits will go to those who work hardest. We expect to increase sales 50 per cent.

MODERN welding methods probably have never been used so extensively in automobile production as in the Ford Model A. On the chassis there are 592 distinct welds, and a total of 1339 metal welding operations are performed in the production of each complete car.

THE FORUM

Two Theories Advanced *to* Account *for* Engine Detonation

Phenomenon may be due to electrostatic ignition or to the reaction of gas molecules following secondary explosion. Tests with cone-shaped bombs suggested.

Editor, AUTOMOTIVE INDUSTRIES:

The writer wishes to advance two theories as to the cause of the phenomenon termed detonation, each one of these theories being more or less dependent on the other.

First is the electrostatic ignition theory. Assuming that the flame progresses uniformly from the point of ignition, the earlier exploded portion of the combustible mixture will effect a super-compression of the unburned portion, causing its movement into a relatively smaller space. This action of super-compression will effect a super-rapid bodily movement of the fuel molecules suspended in the combustion supporting gas (air), as well as a similar movement of the gas molecules themselves. The friction effected by the impact of the dissimilar fuel and gas molecules, due to the super-rapid bodily movement thereof, it is further suggested, produces an electrostatic charge therebetween, sufficient to produce instantaneous self-ignition throughout the entire super-compressed unburned portion of the mixture. The blue spectral lines which have been observed, it is further believed, are produced during the forming of the electrostatic charge, or are the result of the rupture of this charge resulting in the suggested homogeneous self-ignition. The self-ignition of the super-compressed unburned portion of the mixture as suggested would obviously produce a violent explosion which, it is further suggested, might be the origin of detonation.

Reaction Theory

Second is the reaction theory. Again assuming that flame propagation progresses uniformly from the point of ignition—due to the comparatively lower compression of the combustible mixture when flame propagation is initiated, this primary flame propagation is comparatively slow in advancing. Furthermore, due to the progressively increasing pressure of the unburned portion caused by the expansion of the gases in the burning portion, the line of flame ignition thereof in the direction of the unburned portion is retarded as the pressures of both portions tend to equalize. Accepting again the theory that at some instant during the super-compression of the unburned portion, the latter is self-ignited, either, as suggested in the foregoing, by electrostatic ignition, or, as has been previously suggested, from the heat evolved from super-compression caused by the expansion of the burning portion; and, assuming that at the instant this secondary explosion occurs, the fuel in the primary explosion has been substantially consumed, resulting in a lowered pressure of the initially ignited portion of the mixture, perhaps to the extent of even tending to produce a partial vacuum adjacent to the point of ignition, as this secondary explosion occurs the expanding gases resulting therefrom are violently moved in the direction of the point of initial ignition, this movement further resulting in an impact of the gas molecules with the cylinder inclosing walls adjacent to the initial ignition portion thereof, which impact might produce detonation.

It is believed that much light on the subject of detonation can be obtained by conducting tests with cone-shaped or funnel-shaped bombs, by placing firing plugs at both ends of the cone. Whereas a single plug will suffice for the smaller end, it is suggested to employ a number of uniformly spaced plugs at the larger end, to cause the flame subsequent to plug-ignition to move forward substantially as a plane surface. We would further suggest constructing bombs with 30, 60 and 90-deg. bores whereby the rate of advance of the flame front may be varied for observation.

We would also suggest the use of sound-sensitometers, placed in contact with the cylinder wall, to determine at which point of this wall the phenomenon appears to be the more prominent.

O. A. ROSS.

Claims Credit for Detonation Theory

Editor, AUTOMOTIVE INDUSTRIES:

In connection with the articles on detonation by Mr. Janeway in *Automotive Industries* of Nov. 3 and Nov. 10, I should like to take the liberty to call your attention

particularly to a statement contained on page 623 of the Nov. 3 number. It reads as follows:

"It would seem, then, that the fuel molecule undergoes a decomposition or distintegration when a critical condition is reached. The fact that the anti-knock values of different fuels usually follow the stability of the respective molecules also seems to bear out this hypothesis."

This theory that detonation is due to a dissociation of the unburned fuel molecule and not, as has been claimed by most writers on the subject, including Mr. Janeway, to very rapid combustion, was first expressed by me in a paper read before the American Chemical Society at the Washington meeting in April, 1924, which paper was published by the *Oil and Gas Journal* during 1924. This theory which has been underlying my work on Katalite and Kalmite has been also mentioned by you in your article in the April 21, 1928, issue of *Automotive Industries*. It has also been clearly stated in my American patents referring to my detonation counter-actant coating Kalmite.

My investigations have convinced me that this theory of detonation explains all the essential facts pertaining to it, including the reason why certain fuels detonate and others do not, why detonation is accompanied by exceedingly high instantaneous pressures, why detonation causes deposition of carbon, etc. While I appreciate the willingness of others to indorse this theory at the present time, I hope that you will find the above remarks in order and that they might help to clear the misunderstandings which otherwise might easily arise.

EDWARD SOKAL.

The Battery Problem

Editor, AUTOMOTIVE INDUSTRIES:—

The time honored problem of making two blades of grass grow where one grew before still confronts all of us. A number of years ago battery manufacturers made a product that—as we view it today—was badly out of balance. The wood case lasted only about a year; the positive plates lasted one to two years; the negative plates two to four years; the wood separators one to two years, etc. The owner, in order to get three or four years' service, had to have new parts put in every so often; if he junked the battery in a year or so he threw away much valuable material.

"We try to build batteries now like the famous "One-Hoss Shay," all so nicely calculated and balanced that when one part goes, they all go, and the junk man gets what's left.

But improvements can still be made. The battery manufacturer's problem today is to build a battery of the same size or smaller, that will more surely start the average car on the coldest winter night than does the present battery.

When we step on the starter on a cold winter night and the engine is stiff with congealed oil, it will take 200 or more amperes to turn the engine over. Under these conditions the voltage may fall way below five volts and the engine barely turn over. If, however, the battery has very large plate areas, a very porous active material in the plates, and low resistance separators, so that its conductance is ample, it will give up the two or three hundred amperes required and the voltage of the battery will hold up above five volts.

While additional capacity will make it possible to crank a car longer in cold weather, that does not necessarily insure a start. In fact, as every motorist knows, continuous cranking in cold weather for 15 seconds or more is very likely to wet the cylinders and spark plugs with raw gasoline to such an extent that it will not start at all. If the battery has not enough voltage to start the engine in the first few seconds of cranking, it is better to stop and let it rest and then try again. The interval of rest will allow the battery to recuperate and give a higher voltage. This voltage will then give a hotter spark in the cylinders and the engine will be more likely to start than by using the method of continuous cranking.

Just as the motor cars of the present day are more efficient, lighter and less expensive than those of former years, so are the starting batteries. And just as the intelligent motor car manufacturer designs each particular part to function as near to 100 per cent as possible so must the progressive battery manufacturer or any other manufacturer work to keep abreast of the times. This all means study and research, laboratories with proper equipment, and, back of it all, trained men.

CHESTER M. ANGELL,
Engineer, Vesta Battery Corp.

Aluminum Pistons

Editor, AUTOMOTIVE INDUSTRIES:

A good point about the aluminum piston, not usually noticed, is this: When it gets heated, and the piston expands, there is an increase in its height above the piston pin (more than would be the case with a cast-iron piston) and the compression ratio of the engine is raised, with a corresponding increase in the efficiency of the engine.

V. VENUSAWMY IYENGAR,
Madura, India.

Interior of new seven-passenger Hupmobile sedan

Hupp Adds Two Models

ANNOUNCEMENT has been made by the Hupp Motor Car Corp. of the addition of two seven-passenger models, a sedan and a limousine, to its line. They are available either with disk, wire or wood wheels. Lowest price is for the disk wheel equipment with one spare, mounted on the rear, with which equipment the sedan lists at $3,200 and the limousine at $3,380. Both models have Raulang special custom bodies and are mounted on a 10-in. longer, 130-in. wheelbase edition of the eight-cylinder chassis.

First with the News

Reliable and Accurate

News of the Industry

PAGE 952 VOLUME 59 *Philadelphia, Saturday, December 29, 1928* NUMBER 26

1928 Record Production to Approximate 4,650,000

PHILADELPHIA, Dec. 29—With production of approximately 300,000 in December indicated by operations in car and truck factories, the total production for the industry in 1928 will be brought to about 4,650,000, an increase of about 150,000 over the former record total set up in 1926. Production for the industry in 1927 totaled 3,580,000, more than a million lower than in the present year.

Operations in the closing week of the year will be reduced by the holidays, but only few will be closed for inventories or other late year purposes. In many plants work will actually be speeding up on new models which have been sold ahead for varying periods in 1929. Ford dealers, though running into a slow delivery period in December, still have orders many weeks ahead, and Chevrolet and Willys-Overland dealers have built up large order banks at their December showings.

Many factories report dealer stocks of new cars at low level, so much so that the normal increase in retail sales after Jan. 1 will be reflected immediately at the factories. The used car situation is also well in hand.

Durant Sales Meeting Marks Lansing Change

LANSING, Dec. 27—Sales executives of Durant Motors, Inc., met here today in a conference believed to mark the change of general operating headquarters of the Durant interests from Elizabeth, N. J., to this city. No official statement to this effect was made but R. T. Hodgkins, recently named to an executive sales position, said "Michigan is the logical place to build automobiles."

The resignation of J. W. DeBow as western sales manager was announced at the meeting. Other changes in the Durant executive staff are reported awaiting announcement.

Philippines Take 425 Cars

WASHINGTON, Dec. 21—Automotive imports of the Philippines during October were as follows: Passenger cars, 425, valued at 568,000 pesos; trucks, 497, valued at 488,000 pesos; parts for cars and trucks, valued at 214,000 pesos. The figures were contained in a cable to Washington.

Industry Leads Way in Expanding Exports

WASHINGTON, Dec. 26—Terming the automotive and construction industries a gage of American prosperity, Dr. Julius Klein, director of the bureau of foreign and domestic commerce of the Department of Commerce, in a review of the year 1928 and "outlook" for 1929 declared that the automobile has been the most important single factor in the expansion of the foreign trade of the United States.

"The great increase in production and sales of automobiles during the past year," he said, "has had far reaching effects on many other lines of domestic business. A total of more than 4,250,000 passenger cars and trucks were produced in 1928, which was about one-fourth more than in 1927.

"It is an indication of the yet unsatiated demand for automotive vehicles both in this country and abroad. There were also marked increases in the output of rubber tires, gasoline, steel sheets, and many other industries which sell their products to automobile manufacturers or car owners."

Donnet Increases Capital

WASHINGTON, Dec. 22—An increase in the capital of the Donnet Automobile Co. of Levallois-Perret, near Paris, from 14,000,000 francs, about $650,000, to 50,000,000 francs, or about $1,960,000, is announced to the Department of Commerce.

Builds Gasoline Locomotives

CINCINNATI, Dec. 27—Cincinnati Car Co. has started production of a line of industrial locomotives in gasoline, gas-electric, Diesel, electric trolley and storage battery types in sizes ranging from 2 to 50 tons, or larger.

Argentine Imports Establish Record

WASHINGTON, Dec. 26—Argentine imports during November, according to cabled advices to the Department of Commerce, included 5350 American and 215 European passenger cars, and 2270 American and 155 European trucks. November imports of passenger cars and trucks both established a monthly record. For the 11 months imports of passenger cars this year were 46 per cent above 1927, and truck imports were 92 per cent over the corresponding period last year.

New York Abandoned Cars Create Disposal Problem

NEW YORK, Dec. 27—The Bronx Board of Trade has announced that it will seek to have the city adopt a plan for automobile disposal to overcome the present abandoning of automobiles in vacant lots. Among the plans suggested is the maintenance of a smelting plant similar to one operated by the City of Cleveland, or for the admission of automobiles into the classification of refuse which may be taken out to sea in city scows and dumped. A small fee for this service might be collected, it is suggested.

Bermuda Bars Cars for Doctors

NEW YORK, Dec. 27—The Bermuda House of Assembly has refused by a margin of one vote to permit physicians of the colony to operate automobiles, a proposal which would have about doubled the present 10 motor vehicles in the colony. Opponents feared the letting down of bars which would mar the attractiveness of the island for tourists.

Mexico to Reduce Duties

WASHINGTON, Dec. 26—Substantial decreases in duties on automobiles, trucks and bus bodies are expected to go into effect in Mexico before the end of December, the Department of Commerce is advised by cable from Mexico City.

January Production to Set New Record

High Schedules Incidental to New Models Announced by Many Plants

DETROIT, Dec. 28—Automobile manufacturers are preparing for what appears to be the heaviest January production schedule in the history of the industry. Manufacturers who made model changes in mid-year report that sales are holding up satisfactorily while makers who are changing models report dealers in a position to absorb an unusually large number of new cars at once. In considering production possibilities for January it must be recognized that Ford in contrast to last January will be on a heavy production schedule. In addition to the improved Ford situation a number of quantity makers in the lower priced brackets will be operating on heavy schedules in order to supply their dealer organizations with sufficient stocks of new cars to meet current demands.

As an example, Chevrolet has completed tooling up its various plants and according to R. H. Grant, vice-president in charge of sales, his company expects to produce at least 75,000 units in January and the schedule will be stepped up to around 100,000 in February. Chevrolet dealers have received an exceptionally large bank of orders for the new Chevrolet six and Mr. Grant is of the opinion that Chevrolet plants will have to run at peak capacity for at least the first six months of next year to catch up to the volume of orders.

Hudson Motor Car Co., which has just introduced new lines of cars, is another large producer which is planning an exceptional production during the early months of the new year, as is Willys-Overland, which introduced new lines of Whippet models early in December and has built up large order banks at pre-showings.

The Chrysler and Dodge Bros. plants have been undergoing extensive changes in anticipation of very heavy output during 1929. Other units in General Motors besides Chevrolet will be on substantial January schedules, especially Oakland, due to the introduction of new Pontiac models. Activities by these large volume producers is being reflected throughout the industry generally with a result that total January output will result in a figure probably not heretofore recorded.

Schedule 28,000 in Seattle

SEATTLE, Dec. 24—The Ford Motor Co. plant here plans assembling 25,000 passenger cars and 3000 trucks during 1929. At the present time the Seattle branch is turning out 95 complete cars and 122 bodies daily.

Sell 205 in Columbus

COLUMBUS, Dec. 22—The five authorized Chevrolet dealers of Columbus joined in a showing of the new six-cylinder models of that make at the Neil House last week when thousands of people viewed the new cars for the first time. Orders were taken for 205 cars, on which deposits were made and early delivery promised.

Barnes Named to Head Houdaille-Hershey Corp.

NEW YORK, Dec. 27—Stockholders of the Houdaille Corp., the Hershey Corp. and the Oakes Products Corp. will meet Jan. 28 to vote on a plan to consolidate the three companies into a new company called the Houdaille-Hershey Corp., with Claire L. Barnes, now president of the three companies, as president. In a letter to stockholders, Mr. Barnes said:

"I believe the consolidated companies will show net earnings after Federal taxes for the full year ending Dec. 31, 1928, of approximately $2,400,000, equivalent to $13.16 a share on the preference and to $7.71 a share on the Class B stock after dividends on the Class A."

The authorized capital stock of the new company will be 300,000 shares of Class A no-par convertible preference stock and 600,000 shares of Class B no-par stock, 300,000 shares of which will be reserved for Class A conversion.

The plan provides for consolidation of the companies on a share-for-share basis. Each share of Class A convertible preference no-par stock of each company will be exchanged for one share of Class A convertible preference no-par stock of the new corporation, and each share of Class B no-par common stock for one share of no-par Class B common of the new company.

Cars Far Exceed Trucks on Farms in Illinois

CHICAGO, Dec. 22—Eighty-five per cent of the farms in Illinois have automobiles, 13.3 per cent of them have two automobiles and 11.9 per cent have trucks, the Illinois Chamber of Commerce announced this week. This means that there is one automobile on each of 193,936 farms, two on each of 30,017 farms, and there are motor trucks on each of 26,879 farms.

Clark Makes Axle Change

BUCHANAN, MICH., Dec. 24—Clark Equipment Co. is now producing its lightest type passenger car axle with a new style of pressed steel housing. The cast housing is continued in the larger passenger car axle. The company has enlarged its production plants during 1928 and has installed new equipment for increased production.

Seneca Falls Moves Office

DETROIT, Dec. 24—The Detroit office of the Seneca Falls Machine Co. has been moved to 217 General Motors Building, where W. H. Nettle, Mid-West representative, will be in charge.

Business in Brief

Written by the Guaranty Trust Co., New York, exclusively for AUTOMOTIVE INDUSTRIES.

NEW YORK, Dec. 27—With colder weather, trade and industry show more activity than they have for the past two years. The situation is considered sound, and commodity prices show no speculative fluctuations. Holiday buying is unofficially estimated to be 5 per cent above that of last year.

LIFE INSURANCE SALES

November sales of life insurance totaled $722,495,000, which represents an increase of 9 per cent over the same month in 1927. For the first 11 months of the current year, such sales show an increase of 5 per cent over the corresponding period in 1927. The increase is distributed generally throughout the country.

BUILDING CONSTRUCTION

All available records indicate that building construction in 1928 will vary only slightly from that of 1927. According to a recent statement issued by S. W. Straus & Co., based on reports from 587 leading cities, building permits issued during the first 11 months of 1928 represent a value of $3,548,668,073, as compared with $3,550,046,224 in the corresponding period in 1927.

PETROLEUM PRODUCTION

The average daily crude oil production for the week ended Dec. 15 amounted to 2,546,800 bbl., as compared with 2,520,850 bbl. the week previous and 2,456,950 bbl. in the similar week last year.

FREIGHT CAR LOADINGS

Car loadings for the week ended Dec. 8 totaled 984,352. This is 84,566 cars above the figure for the preceding week, which contained the Thanksgiving holiday.

FISHER'S INDEX

Professor Fisher's index of wholesale commodity prices for the week ended Dec. 22 stood at 96.9, which compares with 96.8 the week before and 97.1 two weeks before.

BANK DEBITS

Bank debits to individual accounts outside of New York City for the week ended December 19 were 13 per cent above those in the similar week a year ago.

FEDERAL RESERVE REPORT

The consolidated statement of the Federal Reserve banks for the week ended Dec. 19 showed decreases of $81,600,000 in discounted bills, $41,200,000 in holdings of bills bought in the open market, and $83,100,000 in member bank reserve deposits. There was an increase of $55,000,000 in holdings of Government securities. The reserve ratio on that date was 64.5 per cent, as compared with 64.2 per cent a week before.

N. Y. Bus Companies Plan Reorganization

Automotive Men in Negotiations to Obtain Brooklyn Surface Lines

NEW YORK, Dec. 24—A reorganization of the bus operating companies in New York in which automotive men will have prominent part is expected to be announced this week. Under the reorganization a new corporation would take over the Manhattan part of the Equitable Coach Co. franchise, operating eight crosstown routes. The company would have the same financial backing as Equitable.

Control of all of the 208 miles of surface car lines in Brooklyn is expected to pass to the new Equitable-B. M. T. interests under negotiations which are now getting under way. Sole ownership of Equitable is reported held by Frank R. Fageol, president of the Twin Coach Corp.; Charles B. Rose, president of the American La France-Foamite Corp., and W. A. O'Neal, president of General Tire Co.

Under the plans for developing bus routes in New York under the new control, it is expected that Twin Coach Company will be in line to supply buses to the new merger corporation, and that American La France and General Tire also will be in line for contracts for material and equipment.

Yellow Taxi Denies Plan to Electrify N. Y. Cabs

NEW YORK, Dec. 24—Report that the Yellow Taxi Corp. of New York would electrify its fleet of cabs in the near future has been denied by officials as well as by the Thomas A. Edison Storage Battery Co. The report was based upon a survey made by the Edison company to determine the advisability of substituting electric power to reduce the costs of operating gasoline-driven vehicles with frequent stops caused by traffic conditions. Yellow Taxi officials said the survey had not been acted upon. The Edison investigator said that due to certain conditions, such a step would not be taken for years.

Larrabee-Deyo Numbers Indicate Truck Loads

BINGHAMTON, N. Y., Dec. 22—Announcement of a complete new line of trucks, ranging from 65 to 90 hp., was the feature of the annual sales convention of the Larrabee-Deyo Motor Truck Co. The new line is numbered 20, 30, 40, 50, 60 and 70. By adding two ciphers to the car number the recommended maximum load is obtained.

All six models are powered with Continental engines, ranging from 62 to 88 hp.; engines of the 72, 82 and 88 hp. are of the "F" series, valve-in-head type. The models have heavier frames, new radiator design, larger capacities, four-wheel hydraulic brakes on all models, booster brakes on the four larger models, "helper" type springs which automatically adjust themselves to varying loads, Ross cam and lever gears, newly designed heavy crown fenders, new coupe type cabs on all models, larger gas tanks, larger universal joints on the driveshaft, tilt ray headlights with control on dash, and choice of several wheelbases on all models. Canopy top bodies, tanks and dump bodies will be supplied by the company.

Keys Interests Acquire Sperry Gyroscope Co.

NEW YORK, Dec. 24—Sperry Gyroscope Co. has been purchased by North American Aviation, Inc., according to announcement by C. M. Keys, active head of the North American Investment and Holding Corporation. Mr. Keys is also head of the Curtiss interests. In making the announcement, he said the North American directors were taking the first step in a program of establishing experimental laboratories for the investigation of problems affecting air navigation and equipment.

Elmer A. Sperry will become affiliated with the new organization, the arrangement making it possible for him to devote more time to research and experimental work.

Jail Sentences Meted for Patent Violation

CHICAGO, Dec. 24—Three defendants charged with counterfeiting a patented tire gauge manufactured by A. Schrader's Sons, Brooklyn, were sentenced to one year in Federal prison and also fined $3,000 each by Judge Lindley in the U. S. District Court in Chicago. This is the first case in which criminal prosecution has been obtained in a Federal court against patent violation. The only legal recourse hitherto has been civil action to recover damages.

Warner Aircraft to Build

NEW YORK, Dec. 22—Warner Aircraft Corp. has a production schedule for 1929 of approximately 1000 engines, and orders on hand for 610 engines, according to W. O. Warner, president. Additional plant facilities will be necessary and it is planned to purchase property and erect a new plant by March 1. Directors of the company reelected were Charles B. Bohn of the Bohn Aluminum & Brass Corp.; William B. Stout and William B. Mayo, both of the Ford Motor Co., and W. N. Jones, Detroit banker.

Ford Buys Tire Covers

WATERLOO, IOWA, Dec. 22—Hinson Mfg. Co. has received one of its largest orders from Ford Motor Co., which will require one-third of the plant's product for two months. The order is for 30,000 tire covers.

G.M. Sales at Retail 33,636 Over Shipments

Sales in First Eleven Months Increase 308,184 Over Period in 1927

NEW YORK, Dec. 24—Retail sales by General Motors dealers in the first 11 months this year totaled 1,809,001, a total 33,636 in excess of sales by manufacturing division to dealers over the same period. In 1927 sales by dealers were 1,500,817 as against sales by divisions of 1,502,677. November sales by dealers of 91,410 against factory sales of 47.587 brought dealer stocks of new cars to the low point of the year.

Sales by months were as follows:

Dealers Sales to Users

	1928	1927
January	107,278	81,010
February	132,029	102,025
March	183,706	146,275
April	209,367	180,106
May	224,094	171,364
June	206,259	159,701
July	177,728	134,749
August	187,463	158,619
September	148,784	132,596
October	140,883	153,833
November	91,410	80,539
Total	1,809,001	1,500,817

Divisions Sales to Dealers

	1928	1927
January	125,181	99,367
February	169,232	124,426
March	197,821	161,910
April	197,597	169,067
May	207,325	173,182
June	186,160	155,525
July	169,473	136,909
August	186,653	155,604
September	167,460	140,607
October	120,876	128,459
November	47,587	57,621
Total	1,775,365	1,502,677

Smith Sales Gain 62%

DETROIT, Dec. 24—Peter Smith Heater & Mfg. Co. reports orders for the year to Dec. 1, 1928, showing an increase of 62 per cent over the same period in 1927 and an increase of 104 per cent in the number of new customers. October and November business showed an increase of 40 per cent over the average per month for several months previous and the December showing is expected to be equally good. Prospects for 1929 indicate capacity operations for many months.

Frank H. Page

SPRINGFIELD, MASS., Dec. 22—Frank H. Page, treasurer of the Van Norman Machine Tool Co., manufacturer of machine tools and automotive equipment, died in his home in Longmeadow, Dec. 19, of heart disease. He was also president of the National Equipment Co., whose products include the Kobert electric forging and riveting machine, and was a director of the Springfield National Bank.

An Automotive Home for the President's Holiday

View of the Sapelo Island home, near Savannah, Ga., of Howard E. Coffin, vice-president of Hudson Motor Car Co., which the President and Mrs. Coolidge are using for the holiday season. In recent years Mr. Coffin has been active in aviation development, maintaining offices in Washington, where he also has served on several Government assignments. Mr. Coffin's name is being mentioned prominently as Secretary of Commerce in the new Hoover cabinet

Waldorf-Astoria Greets Last Show Week Crowd

NEW YORK, Dec. 22—Visitors to the 1929 New York show will have their last show week opportunity of stopping at the Waldorf-Astoria, world famous hotel with its renowned Peacock Alley. Early next year the Waldorf is coming down to make way for a 50-story office building but there is possibility that a new hotel of the same name may be built in the newer hotel district.

Though a little too far down to get much of the automobile show week crowd, there was always a representation of automobile people at the Waldorf with a sprinkling of special exhibits and several important show week meetings. Among the Waldorf events scheduled during the 1929 show is the American Automobile Association meeting Jan. 7. Throughout its life it was always a noted meeting place for financial men and many important industrial developments, notably the creation of the U. S. Steel Corp., had their preliminaries in Waldorf conferences.

Gears & Forgings Builds

CLEVELAND, Dec. 24 — Gears & Forgings, Inc., is completing a three story addition to its Cleveland plant which will provide 20,000 sq. ft. of additional space for production of speed reducers. Early in 1929 the manufacture of all speed reducers under 50 hp. will be shifted to the Cleveland plant.

Plymouth Prices Reduced $25 to $40 by Chrysler

DETROIT, Dec. 22—Price reductions ranging from $25 to $40 effective this week have been announced on Plymouth cars by the Chrysler Corp. Prices of open models remain unchanged at $675 for the roadster and $695 for the touring. New prices follow: Two-passenger coupe, $655, down $30; two-door sedan, $675, down $25; four-door sedan and de luxe coupe, $695, down $40.

Production of Plymouth cars is being transferred to one of the Dodge plants.

Goodrich Offers Cavalier

AKRON, Dec. 24—The B. F. Goodrich Rubber Co. has introduced a companion to the Silvertown line in the "Cavalier" tire. It is being offered to furnish dependable and economic transportation as a standard tire for motorists who want tires to fill out the life of cars.

Niles Tool and Hooven Form General Machinery

DETROIT, Dec. 22 — Niles Tool Works Co., subsidiary of Niles-Bement-Pond Co., and Hooven-Owens-Rentschler Co., both of Hamilton, Ohio, have been merged into a new company to be known as General Machinery Corp. Niles-Bement-Pond receives common stock in the new corporation for stock of Niles Tool Works.

G. A. Rentschler, president of Hoven-Owens, will be president of the new corporation. He is a brother of Gordon S. Rentschler, of the National City Bank, and of Fred B. Rentschler, president of the New United Aircraft & Transport Corp., which combined Pratt & Whitney Aircraft Co., another Niles-Bement-Pond subsidiary, with Boeing Airplane & Transport Co. and Chance Vought Corp.

Elcar Arranges Time Sales

ELKHART, IND., Dec. 24 — Elcar Motor Co. has completed arrangements with Commercial Credit Co. for handling instalment sales of its dealer organization. The new plan is now in effect, according to announcement by F. B. Sears, president of Elcar.

Men of the Industry and What They Are Doing

Durant Prohibition Prize Won by Ex-Administrator

The $25,000 prize offered by W. C. Durant for the "best and most practicable plan for making the Eighteenth Amendment effective" was awarded to Major Chester P. Mills, former Federal prohibition administrator for the New York district. The winner of the $5,000 school prize was Malcolm D. Almack, representing the Palo Alto (Cal.) High School.

Major Mills' plan deals in detail with the prevention of diversion of industrial alcohol. Mr. Durant said the publication of Major Mills' plan was the first step in making available to the government and to the people the material accumulated in the contest.

The competition brought 23,230 contestants, half of whom were women, representing all states and many foreign countries. New York entered 2104 plans; Pennsylvania, 1455; California, 1128; Massachusetts, 732, and Missouri, 673.

Dickinson Advertising Director

Supplementing the appointment of Henry Krohn as sales manager, announcement of which was made last week, R. S. Cole, vice-president in charge of sales of Hupp Motor Car Corp., has appointed Frederick Dickinson director of advertising. Mr. Dickinson joined Hupp in 1915, was named advertising manager in 1917, and in 1918 was promoted to assistant sales manager, continuing his supervision of advertising. In his new work, Mr. Dickinson will devote his entire time to supervising advertising and sales promotion policies. [Oh, yes! That was Mr. Krohn's picture in last week's *Automotive Industries* that we failed to identify by name. Hardly necessary, but then . . . Ed.]

Austin to Attend Show

Among the prominent foreign figures in the automobile industry who will be represented in the International Day program of the New York show are Sir Herbert Austin, chairman of Austin Motor Co. and representative of the Society of Motor Manufacturers & Traders of Great Britain, and Haritan Kassardjian, representing the trade in Roumania.

Hanson Heads Dealer Sales

H. C. Hanson, formerly manager of the Fisk Tire Co., truck and bus department, has been named head of the newly created car dealer sales department, which will supervise and promote tire sales to dealers of cars using Fisk as original equipment. Thomas B. Summers succeeds Mr. Hanson as manager of the truck and bus department.

Velie Leaves Estate Exceeding $1,500,000

Willard L. Velie, deceased head of the Velie Motors Corp., left an estate of $1,500,000, exclusive of real estate and other holdings, according to petition for letters testamentary filed in the probate court at Moline. The will leaves half the estate to his widow, Mrs. Annie F. Velie, and the remainder to be divided equally between his son, Willard L. Velie, Jr., who has succeeded his father as head of Mono Aircraft, Inc., and his daughter, Mrs. Marjorie V. Heard.

Henderson Heads Association

Col. Paul Henderson, former second assistant postmaster general, has been elected president of the American Air Transport Association, according to an official announcement here. He is already vice-president of the Transcontinental Air Transport and vice-president and general manager of National Air Transport. The American Air Transport Association is composed of 17 air mail, express and passenger companies.

Gardner Gives Trophy

Russell E. Gardner, Jr., president of the Gardner Motor Co., is the donor of the Gardner cup and $10,000 in prizes to be awarded winners of the Gardner Cup Race, approved this week by the National Aeronautic Association. The races will be held May 28, 29 and 30 and will terminate at Parks Airport, near East St. Louis. Mr. Gardner is a director of Parks Aircraft, Inc.

Evans Succeeds Mason

Austin Evans has joined the staff of C. Cowles & Co., New Haven, Conn., as sales representative for Michigan, Wisconsin, Illinois and Indiana, succeeding Roy C. Mason, who is resigning. Mr. Evans will be in charge of the Detroit office, 607 Fischer Building.

Halley With Chrysler Sales

D. G. Halley, for the past four years Eastern sales manager of the Gardner Motor Co. and personal representative of Russell E. Gardner, president, has resigned to join Chrysler Sales Corp., Detroit.

Stinson Under Operation

Eddie Stinson, noted aviator and head of the Stinson Aircraft Corp., underwent an operation for appendicitis in Detroit Dec. 21.

Chrysler Officials Stage Dodge Division Meeting

The first national convention of the Dodge Brothers dealers organization since Walter P. Chrysler acquired Dodge Brothers, Inc., was held Dec. 19 and 20, in Masonic Temple, with 2000 dealers in attendance. Speakers at the convention were Joseph E. Fields, vice-president in charge of sales for all divisions of the Chrysler corporation; John R. Lee, assistant to Mr. Fields; F. M. Zeder, Chrysler vice-president in charge of engineering, and Charles W. Matheson, general sales manager for Dodge Brothers.

At the convention banquet the chief speakers were Walter P. Chrysler; K. T. Keller, vice-president of the Chrysler corporation and general manager of Dodge Brothers; B. E. Hutchinson, Chrysler vice-president in charge of finance, and A. E. Duncan, chairman of the board of Commercial Credit Co. The convention closed Thursday afternoon with inspection of Dodge Brothers plants.

Thomson Names Representatives

Thomson Electric Welding Co., Lynn, Mass., has named Hugh W. Rankin, formerly with E. W. Bliss Co., representative in the Detroit and Michigan territory with offices in General Motors Building. Effective Jan. 17, C. W. Hill will resume sales in the entire New England territory, which is now being covered by Taylor Hall Welding Corp., Worcester, Mass., as agent.

Wheeler Heads Ramsey Sales

D. I. Wheeler, formerly connected with the sales department of the Whitney Mfg. Co., Hartford, Conn., has assumed the duties of sales manager of the Ramsey Chain Co., Inc., Albany, N. Y., manufacturer of Ramsey silent timing chains and national distributor of Pratt-Ramsey mufflers.

Smith Gets AC Territory

A. H. Smith has been appointed territory representative of the AC Spark Plug Co. Mr. Smith has been an AC dealer salesman for a number of years and will contact with jobbers in the northern half of Ohio, Pennsylvania and West Virginia.

Dresser With Kent Garages

Sidney R. Dresser has resigned from the Whitney Blake Co., New Haven, Conn., to become assistant to the president of the Kent Garage Investing Co., with headquarters in New York.

Russell on West Indies Trip

F. H. Russell, vice-president of Curtiss Aeroplane & Motor Co., Inc., has sailed on a cruise of the West Indies.

O. W. Hayes Dies of Influenza Attack

President of Republic Truck Succumbs in Ann Arbor Hospital

DETROIT, Dec. 28—Oliver W. Hayes, 43-year old president of the Republic Motor Truck Corp., died Christmas Day in the University of Michigan Hospital at Ann Arbor, of meningitis, after having apparently recovered from an attack of influenza. Mr. Hayes suffered an attack of influenza last week and apparently had recovered. Monday he experienced a relapse and was rushed to Ann Arbor where he died the following day.

Mr. Hayes first entered the automotive industry with Chevrolet Motor Co. at Flint. He went to the Republic company in 1913 as a bookkeeper and rose to the position of purchasing agent and then to factory manager in charge of production. Shortly after the war he was promoted to second vice-president and in 1923 when the company was reorganized, he was elected to be president of the company, which position he continued to hold at the time of his death.

Under his direction the company had made substantial progress in the past five years. Taking over the company after its reorganization, Mr. Hayes assembled a new factory organization and developed practically an entire new line of vehicles for which he developed a large domestic and export market. In the past year he took over the Lynn tractor and combined it with the Republic line.

Private funeral service will be held from his late residence in St. Louis, Mich., today. Besides his widow he leaves three children.

Italy Gets Sauer License

WASHINGTON, Dec. 26—Arrangements have been completed whereby manufacture of Sauer trucks will be undertaken under license in Italy in the near future, the Department of Commerce is advised in correspondence from Milan. Details of the concession to manufacture the Swiss product in Italy have not yet finally been completed but it is expected that production will start in June of next year.

Forms Canadian Metalcraft

GRAND RAPIDS, Dec. 24—Stockholders of Grand Rapids Metalcraft Corp. of Jan. 3 record will have right to subscribe for stock in the new Canadian Metalcraft Corp., Ltd., at $1.25 a share, at the ratio of one share of Canadian for each two shares of Grand Rapids. The Canadian company has taken over all Canadian patents and rights for the Kelch heater and will also handle Canadian business on automobile garnish moldings, door panels, vanity cases, smoking sets, etc. S. E. Ryder, formerly general manager of the Moto Meter Co. of Canada, will be manager. Directors of the Grand Rapids company have declared the regular cash dividend and an extra cash dividend of 17½ cents a share.

Graham-Paige Operates Service Manager School

DETROIT, Dec. 24—Graham-Paige service managers and shop foremen from all over the country are to receive a course of training in a new service school opened here by the Graham-Paige Motors Corp. Besides practical training in the best methods of repairing and maintaining Graham-Paige cars, the classes will be taught the most up-to-date systems of service station management.

The new school has been established in the recently acquired and remodeled buildings at Fort and McKinstry Streets housing the factory service department. Each class is limited to 50 men and lasts two weeks. The school will run continuously, drawing its members from all over the United States and Canada. W. J. Collier, of the factory service department, is director. Lectures and practical instruction are given by Mr. Collier, W. L. Kessinger, director of service; S. E. Jamieson, manager of the technical service division; W. V. DeGalan, manager of parts merchandising, and Ray Ayer, M. R. Peck, and G. L. Reynolds, all of the technical service division.

Nash Gives Employees $807,000 for Christmas

KENOSHA, Dec. 24—Nash Motors Co. distributed $807,000 in Christmas bonuses this year as against $721,000 a year ago. C. W. Nash, president, and M. H. Pettit, vice-president, gave out the checks and cash in person.

C. G. Rowlette Dies

DETROIT, Dec. 24—C. G. Rowlette, vice-president of the Timken Detroit Axle Co., died suddenly today.

Budd Wheel Gets Contract

PHILADELPHIA, Dec. 26 — The Budd Wheel Co. announces that it has received a Christmas contract from a leading automobile manufacturer for wire wheels for the year 1929 totaling approximately $2,500,000.

Hisey-Wolf Opens Chicago Office

CHICAGO, Dec. 22—Hisey-Wolf Machine Co., Cincinnati, manufacturer of electric drills, grinders and buffers, has opened a branch office at 210 Machinery Hall, 549 W. Washington Blvd., Chicago, as the first of several new offices in principal centers giving closer cooperation with the trade. The Chicago office will be in charge of Roy D. Haworth.

Financial Notes

Republic Brass Corp., recently organized to take over the business and assets of six copper and brass manufacturing companies, has floated an issue of bonds to the value of $10,000,000 in first mortgage 6 per cent sinking fund gold certificates, Series A. This issue, with $10,000,000 par value of 7 per cent cumulative preferred stock, 250,000 shares of convertible Class A stock without par value and 507,841 shares of common stock without par value, has been issued by the Republic Brass Corp. in connection with the acquisition of the assets of the former companies and for additional working capital.

Humber Co., British manufacturer, will purchase all the Hillman Motor Co. shares, paying 300,000 Humber £1 shares and an option for two years to purchase 107,000 more at 25 shillings each. Two Hillman nominees will join the Humber board in place of two who will retire. Hillman net profit for the year ended July 31 was £56,300. Humber reported a loss of £36.805 during its past financial year, despite the better results shown by its subsidiary, Commer Trucks.

Wayne Pump Co. has completed negotiations for the acquisition of the Fry Equipment Corp. by the issuance of 25,930 shares of convertible preference stock and 18,000 shares of common stock. Wayne recently acquired the Boyle-Dayton Co.

New Pontiac Presentation Set for New York Show

PONTIAC, Dec. 24—Introduction of the new Pontiac is scheduled for the New York show opening with showings in dealer salesrooms scheduled for immediately thereafter. Production of Pontiac and Oakland cars in 1928 is expected to total 260,000 against 193,000 in 1927.

The company opened a district sales office in Los Angeles in December, making 25 now in operation throughout the country. H. P. Grove, formerly district manager at San Francisco, is in charge. The district office at Butte was transferred to Spokane during the month, the same office personnel continuing. Changes in the field organization brought W. H. Loudon, district manager at Memphis, to the home office. W. R. Cartwright, formerly assistant manager at Buffalo, went to Memphis as manager and was succeeded at Buffalo by B. L. Morris, formerly assistant manager at New York. P. F. Murray succeeded Mr. Morris in New York.

Complete Evansville Plant

EVANSVILLE, IND., Dec. 24—The new $1,500,000 factory of the Graham-Paige Body Corp. will go into production about Jan. 15, and by Feb. 1 will probably be entered upon normal production schedule, according to C. R. Stone, secretary. The new factory is equipped to produce 350 bodies a day, and at peak production will employ 1600 people.

Steel Mill Orders Highest in Years

Good - Sized Tonnages of Sheets Reported Ordered at New Prices

NEW YORK, Dec. 27—A decidedly cheerful tone is in evidence in the end-of-the-year steel market. Not only is the outlook for 1929 bright, but producers have a larger quota of orders on their books than they have had at the end of recent years. Lower priced commitments in the sheet market than at the levels now in vogue have been fully specified against and good-sized tonnages of full-finished automobile sheets have been ordered at the 4.10 cents, Pittsburgh, price, specifications and shipping instruction accompanying the orders.

Competition in both hot and cold-rolled strip steel is exceedingly keen, and in some quarters it is suspected that orders are lost here and there as the result of price concessions by competitors. Cold-finished steel bars are being ordered in a routine way, the price situation being such that automotive consumers feel no special urge to anticipate their requirements too far ahead nor do they see any reason why they should hold back orders for their normal operating schedules.

With fourth-quarter prices on bolts and nuts reaffirmed for the first quarter of 1929, quite a little ordering has been done in the last few days. Automotive alloy steel specialists have a fair volume of first-quarter business on their books. Non-integrated sheet rollers have specified heavily against $33 sheet bar contracts which expire with the end of the year.

Mills have been very liberal in permitting their customers to specify heavily against old contracts, these contracts being more or less of an informal character, so that many sheet rollers will enjoy the $33 price for their semi-finished material requirements in January, while their finished product will carry an advance of $2 per ton. It will be largely on their February sheet bar requirements that rollers will have to pay the advanced price of $34.

Pig Iron—Automotive foundries appear to have considerable fourth-quarter iron still due them, and in some cases this will obviate the necessity of fresh buying until the first quarter is well advanced.

Copper—The domestic market wears a holiday air, consumers having covered their requirements well into February. Price remains at 16 cents, delivered Connecticut point, and 16⅛ cents, delivered Middle West.

Tin—The market is dull, with the price of spot metal ranging from 49⅜ cents upward.

Lead—Demand is quiet and prices are unchanged. Storage battery manufacturers are not very active on the buying side.

Zinc—Shut-downs of the Joplin mines over the holidays are expected to enhance the market's steady tone.

Factory and Dealer Events Scheduled for National Show Weeks

NEW YORK SHOW

Jan. 5	Studebaker Corp.	Dinner	7.00 P. M.	Commodore
Jan. 5-12	Hupp Motor Car Co.	Luncheons	12.45 P. M.	Commodore
Jan. 5-12	Locomobile Co.	Meetings	2.00 P. M.	Commodore
Jan. 7	Oakland Motor Co.	Dinner	6.30 P. M.	Penna.
Jan. 7	Rubber Association	Meeting	10.30 P. M.	Commodore
Jan. 7	Rubber Association	Dinner	7.00 P. M.	Commodore
Jan. 7	Amer. Auto. Assoc.	Meeting		Waldorf
Jan. 7	N.A.D.A.	Convention		Commodore
Jan. 7	S. A. E.	Meeting		Commodore
Jan. 7-8	Packard Motor Co.	Meetings		Roosevelt
	(Exclusively for Packard Distributors)			
Jan. 7-8	Robert Bosch Magneto Co.	Luncheon and Meeting		Hotel Astor
Jan. 7-9	Automotive Elec. Assoc.	Luncheon and Meeting		Hotel Astor
Jan. 8	Motor & Accessory Manufacturers (Export Group)	Luncheon and Meeting		Hotel Astor
Jan. 8	Graham-Paige	Luncheon	12.30 P. M.	Biltmore
Jan. 8	Natl. Assoc. of Show & Assoc. Mgrs.	Luncheon	1.00 P. M.	Park Central
Jan. 8	De Soto Motor Co.	Luncheon		Commodore
Jan. 8	N.A.C.C.	Dinner		Commodore
Jan. 9	Olds Motor Works	Dinner	7.00 P. M.	Roosevelt
Jan. 9	Jordan Motor Car Co.	Luncheon		Commodore
Jan. 9	Franklin	Luncheon		Commodore
Jan. 9	Motor & Equipment Assoc.	Dinner		Commodore
Jan. 8	Auburn Auto. Co.	Luncheon	1.00 P. M.	Commodore
Jan. 9	Reo Motor Car Co.	Dinner		Hotel Astor
Jan. 9	Chrysler Sales	Luncheon	12.30 P. M.	Commodore
Jan. 9	Warren-Nash Motors	Luncheon	12.30 P. M.	Penna.
Jan. 9	Automotive Elec. Association	Meeting	10.00 A. M.	Hotel Astor
Jan. 9	Peerless Motor	Dinner	6.30 P. M.	Commodore
Jan. 9	Gardner Motor Co.	Luncheon	1.00 P. M.	Belmont
Jan. 10	Willys-Overland	Dinner	7.00 P. M.	Commodore
	(Admittance by card only)			
Jan. 10	Buick Motor Car Co.	Luncheon		Commodore
Jan. 10	Durant Motor Co.	Luncheon	12.00 Noon	Roosevelt
Jan. 10	S. A. E.	Dinner	6.00 P. M.	Waldorf
Jan. 11	Chevrolet	Meeting	1.30 P. M.	Mecca Temple
Jan. 11	Chevrolet	Banquet	6.30 P. M.	Mecca Temple

CHICAGO SHOW

Jan. 25	Chicago Auto Trade	Dinner	6.30 P. M.	Palmer House
Jan. 25	Cadillac	Dinner		Blackstone
Jan. 26-Feb. 2	Locomobile Co.	Meeting	2.00 P. M.	Blackstone
Jan. 26-Feb. 2	Hupp Motor Co.	Luncheons	12.45 P. M.	Stevens
Jan. 28	Studebaker	Dinner	7.00 P. M.	Palmer House
Jan. 28	Graham-Paige	Luncheon	12.30 P. M.	Palmer House
Jan. 29	Oakland	Dinner	6.30 P. M.	Palmer House
Jan. 29	Auburn	Luncheon	1.00 P. M.	Stevens
Jan. 29	Nash Sales Corp.	Luncheon		Congress
Jan. 29-30	Auto. Elec. Assoc.	Meeting	10.00 A. M.	Stevens
Jan. 30	Chrysler	Luncheon	12.30 P. M.	Congress
Jan. 30	Peerless	Dinner	6.30 P. M.	Congress
Jan. 30	Willys-Overland	Dinner	7.00 P. M.	Palmer House
	(Admittance by card only)			
Jan. 30	Franklin	Luncheon		Blackstone
Jan. 30	Natl. Association of Show and Association Mgrs.	Meeting and Luncheon		Drake Hotel
Jan. 30	Olds Motor Works	Banquet		Congress
Jan. 31	Reo	Dinner		Congress
Jan. 31	De Soto Motor Co.	Luncheon		Congress
Jan. 31	Marmon Motor car Co.	Luncheon		Blackstone
Jan. 31	Buick Motor Car Co.	Meeting		Blackstone
Feb. 1	Chevrolet	Meeting	1.30 P. M.	Majestic Theater
Feb. 1	Chevrolet	Banquet	6.30 P. M.	Palmer House
Jan. 28-29	N.A.D.A.	Convention		Palmer House
Jan. 28-29	Packard Motor Co.	Meetings		Blackstone
	(Exclusively for Packard Distributors)			
Jan. 29	Nat'l Automobile Dealers Assoc.	Banquet		Palmer House
Jan. 30	Gardner Motor Co.	Luncheon	1.00 P. M.	Blackstone

A.A.A. Would Scrap Present Race Cars

Technical Committee Moves to Base Designs on Current Passenger Cars

DETROIT, Dec. 22—A move to put automobile racing on a paying basis and to make it of value to the automobile manufacturing industry was accomplished here this week. In an all-day session of the technical committee of the American Automobile Association, preceded during the past few months by considerable research work, specifications for racing cars to take effect in 1930 were formulated. While the final rules have not as yet been adopted, the general tendency is to obsolete entirely the present type of 91½ cu. in. car of high engine speed, small size, and low weight, and to replace them by designs based on current passenger car practices.

With a considerable agitation for the revival of stock car racing during the past two years and the signal failure of reachiing an agreement of what constitutes a stock car, this new development promises to offer a happy solution in making the race track again a laboratory for the investigation of production and experimental production designs.

For instance, piston displacement is being opened up so as to enable the inclusion of practically all production passenger cars in the United States, but cars of larger piston displacement will have to have a proportionately higher chassis weight according to the requirements under the new rules. There seems to be every indication that the supercharger will be barred from racing cars for the time being, as this is the only logical method of procedure consistent with the opening up of the displacement question. Similarly there will be limitations placed on the number of valves allowed per cylinders, number of carburetors permitted, etc., consistent with the idea of providing an equal opportunity for small, as well as large engines, to race on a really competitive basis.

One of the features of the new rules will probably be a specification requiring an extra seat to carry a mechanic in long races, this also being in line with the idea of bringing racing cars closer to the ideal production speedster type. There will also be minimum tread and wheelbase specifications.

Finland Tightens Credits

WASHINGTON, Dec. 22—A detrimental effect on automotive business is reported in Finland, due to the decision of State banks to discontinue rediscounting of automotive paper, after Jan. 1, according to a cable from Helsingfors to the Department of Commerce. "Dealers already in a very bad condition," the cablegram stated.

Twenty-Foot Roads Endorsed by Bureau

WASHINGTON, Dec. 22—The Bureau of Public Roads has set 20 ft. as the safe width of highways as a result of study of drivers' habits by bureau engineers. From observation, the engineers reported that passenger car drivers habitually maintain a distance of from 1½ to 4 ft. from the edge of the pavement although truck drivers operate somewhat closer the edge, preferring, however, not to approach closer than 1½ ft. The bureau finds that pavements less than 18 ft. wide are "decidedly too narrow" and states that the 20 ft. width "gives ample clearance for trucks and is not excessive for automobiles."

Driver Licenses Urged by N.A.C.C. as Safety Aid

NEW YORK, Dec. 22—Pointing out that National Safety Council statistics indicate a 20 per cent decrease in accidents in states having drivers' license laws, Edward S. Jordan, head of the street traffic committee of the National Automobile Chamber of Commerce, has issued a bulletin urging the adoption of such a law in all states.

At present there are only 11 states having drivers' license laws. This winter 43 states will hold legislative sessions and it is expected that many will consider drivers' license laws based on the code adopted by the National Conference on Street and Highway Safety.

Rail Executives Foresee Northwest Business Gains

PORTLAND, ORE., Dec. 22—A big era of prosperity for the Pacific Northwest is in prospect. There will be increased activity in most major lines. Brighter days for agriculture are in the offing. There will be greater opportunities in foreign trade. Industrial expansion will be substantial in nature. Conditions of the livestock industry will continue to improve.

Such were some of the reassuring highlights voiced at the annual meeting of the Pacific Northwest Advisory Board of the American Railway Association held here Dec. 14. Representatives of all lines of activity, totaling more than 600, were in attendance. A. W. Cooper of Portland, general chairman, presided.

Clayton & Lambert Moves

DETROIT, Dec. 22—Clayton & Lambert Mfg. Co. is moving to its new plant on French Road. The new plant is 800 ft. long and 100 ft. wide.

Exports 77% Ahead of 5-Year Average

All Exports Total $3,559,000,000, an Increase of 8% Over Average

WASHINGTON, Dec. 26—The value of automotive exports during the first nine months of 1928 were 77 per cent above the average for the corresponding period of the last five years, according to a bulletin entitled "Our World Trade" issued by the foreign commerce department of the Chamber of Commerce of the United States.

During the first three quarters of the year 1928, the foreign trade of the United States totaled $6,628,000,000 or nearly 5 per cent greater than the average for the five corresponding nine-month periods of 1923-1927, the bulletin says. Exports amounted to $3,559,000,000, the largest since 1920, 1.4 per cent above 1927 and 8 per cent over the five-year average, while imports amounted to $3,070,000,000, 2.7 per cent below the 1927 figures but still 1.5 per cent higher than the 1923-1927 average receipts.

Finished manufactures have shown a steady increase from $1,120,000,000 total for the first three quarters of 1923 to $1,668,000,000 for the first three quarters of 1928, a gain of almost 50 per cent. Compared with 1927, this group showed a gain of almost 11 per cent and 25 per cent above the five-year average. Finished manufactures constitute nearly 48 per cent of the exports and the automotive manufactures constitute a large proportion of this group.

Southern Pacific Buses to Replace 44 Trains

LOS ANGELES, Dec. 24—Following the recent decision of the California State Railroad Commission, granting the Southern Pacific Co. the right to enter unrestrictedly the motor-transport field, announcement is made by the railroad corporation that it will substitute motor stages for 44 or more trains on local runs in northern, central and southern California.

The motor-transport operators plan to fight in the courts—which have the power of revision over the railroad commission—against this invasion of their field over the rail lines. They have raised the point that the commission, in conformity with its announced policy of keeping down competition in districts already adequately served, legally has not the power to grant such authorization as it has given the Southern Pacific.

"After all, the public is not interested in this railroad or that stage operator. What it wants is good transportation. If this can be obtained by one stage line occupying the public highways, the public is better served than if there are two or more stage lines congesting the same or parallel highways", a dissenting opinion held.

Consolidations Aid Belgian Producers

BRUSSELS, Dec. 22—America headed the list of exhibitors at the twenty-second annual Belgian automobile show held this month in the Cinquentenaire Palace, with 26 makes represented, followed by France with 25. Belgian makers were nine in number. The British, Italian and German industries had meagre representation.

Because of foreign competition there has been a consolidation of Belgian interests. Imperia, Nagant and Excelsior have been grouped, and although having independent factories, the designing, experimenting and purchasing departments are common to all three. Minerva and F.N., the two biggest producers in Belgium, have an agreement by which they will not produce competitive models. To a very large extent the financial interests of these two concerns are common. The Metallurgique car is in the Imperia-Nagant-Excelsior group, but for the present the car is not being produced.

The only other manufacturing interest is Ford, with an assembly plant at Hoboken which has not been very active during the past year. It is declared that this factory will shortly get into production at the rate of 100 cars per day, but not all these are intended for the Belgian market. Chrysler is partially assembling in the former Ford factory in Antwerp, and arrangements are being made for the De Soto car to be partially assembled in this plant.

The F.N. Co. is completing factory extensions which will enable production to be carried up to 5000 cars a year in 1929 and 12,000 the following year. It is stated that new six and eight-cylinder models are being prepared by Minerva and that a new high class job is in hand at the Excelsior factory.

Morris Builds Boat Engine

LONDON, Dec. 24—A powerplant for motor boats has been put on the market in England by the makers of Morris passenger cars and trucks. The four-cylinder engine corresponds in general design with that of the 14 hp. Morris car, and all moving parts, except additional features, such as the water pump, are interchangeable with the car engine. The plant weighs 530 lb. and sells at £100.

Coming Feature Issue of Chilton Class Journal Publications

Feb. 23—Statistical Issue Automotive Industries.

M. & E.A. Sales Committee to Outline Program Jan. 9

CHICAGO, Dec. 22—With a view to outlining a program for 1929, the sales development committee of the Motor & Equipment Association met in first formal session at the Hotel Stevens this week, but adjourned to meet again in New York, Jan. 9. At that time a definite program will be outlined and presented to the executive committee which will meet in New York the following day. Those in attendance were W. S. Isherwood, vice-president of Division B; M. L. Heminway, general manager of the association; Neal G. Adair, sales development manager; Martin E. Goldman, assistant sales development manager; T. W. Whipple, chairman of the committee; N. C. DeWitt, vice-chairman of the committee; George L. Brunner, W. G. Hancock, Fred Campbell, T. I. Jenks, Charles C. Gates, T. F. Bellisle and George W. Fleming.

12 Exhibits at Empire Hotel

NEW YORK, Dec. 24—Exhibits will be staged at the Hotel Empire during show week by Aluminum Industries, Inc., Spencer-Smith Machine Co., John C. Hoof Co., Federal-Mogul Corp., Perfect Circle Co., World Bestos Corp., G. H. Mfg. Co., King Quality Products, Burgess Norton Mfg. Co., Brown-Lipe Gear Co., Dall Motor Parts Co. and I. T. M. Gear Co.

Perfect Circle Adds Units

HAGERSTOWN, IND., Dec. 24—Contracts have been let and work is progressing on two new saw-tooth units for the Tipton plant of the Perfect Circle Co. These will give the company 7500 sq. ft. of floor space which is needed to take care of increasing demand from manufacturers and the replacement trade. New machinery has been ordered and it is expected that the two new units will be in operation by Jan. 15.

Parker Introduces New Motor Bus Bill

WASHINGTON, Dec. 26—A new bill for Federal regulation of interstate motor bus traffic (H.R. 15621) giving jurisdiction over tariffs and rates for fares to the Interstate Commerce Commission and providing for the issuance of certificates of public convenience and necessity to the operators of interstate bus lines, has been introduced in the House of Representatives by Representative Parker as a substitute for a previous motor bus bill (H.R. 12380).

The new bill exempts from its provisions taxicabs of a capacity of six passengers or less and all motor vehicles which do not carry or transport persons.

The regulation of the interstate passenger bus traffic would be vested in the Interstate Commerce Commission and joint boards set up in the various states affected, in so far as the grant of certificates to bus lines are concerned. All rates, fares and charges of motor carriers shall be stated in money, according to the provisions of the new act and shall be just and reasonable. Tariffs will be prepared, filed and posted in such manner as may be prescribed by the Interstate Commerce Commission and rebates and refunds are absolutely prohibited.

Bus lines in operation Nov. 1, 1928, and continuing in bona fide operation until the date of the passage of the bill, will be given preferred status in the granting of certificates.

Brown Moves N.Y. Office

NEW YORK, Dec. 24—The New York office of the Brown Instrument Co. has been moved to Room 1502, Roebling Building, 117 Liberty St. This change was made necessary by the need for larger quarters to provide for the increased staff now attached to this district office.

Russell Hits Brake Doping

MIDDLETOWN, CONN., Dec. 24—Russell Mfg. Co. has issued orders to all of its representatives to report all individuals or concerns engaged in the doctoring of brakes or treating brake linings with dopes as part of a campaign which it is waging against doctored brakes in the interest of safety.

Calendar of Coming Events

SHOWS

All-American Aircraft Show, Detroit Board of Commerce, Detroit..Apr. 6-14
American Road Builders Association, Inc., Cleveland Auditorium..Jan. 14-18
Amsterdam Automobile Show....Jan. 11-20
Automobile Salon, Inc., Hotel Drake, Chicago .....Jan. 26-Feb. 2
Automobile Salon, Inc., Hotel Biltmore, Los Angeles.....Feb. 9-16
Automobile Salon, Inc., Palace Hotel, San Francisco .....Feb. 23-Mar. 2
Boston, Mass., Mechanics Bldg...March 2-9
*Chicago, National, Coliseum, Jan. 26-Feb. 2
Geneva Automobile Show .....Mar. 15-24
Leipzig, Germany, Fair.....Mar. 3-13
Melbourne Automobile Show.....May 2-11
*New York, National, Grand Central Palace .....Jan. 5-12
Rome Automobile Show.....Jan. 30-Feb. 16
Western States Metal and Machinery Exposition, Los Angeles.....Jan. 14-18

CONVENTIONS

American Road Builders Ass'n, Inc., Cleveland Auditorium.....Jan. 14-18
American Society for Steel Treating, Semi-Annual Meeting, Los Angeles .....Jan. 14-18
Chicago Power Exhibition and Conference, Coliseum, Chicago....Feb. 12-16
Manufacturers & Distributors of Motor Truck Equipment, Cleveland, Ohio .....Jan. 15
National Automobile Dealers Association, Palmer House, Chicago..Jan. 28-29
National Metal Congress, Los Angeles, Jan. 14-18

S. A. E. National

Detroit, Book-Cadillac, Jan. 15-18—Annual.
New York, Hotel Astor, Jan. 10—Annual Dinner.

* Will have special shop equipment exhibit.